Heating Piping & Air Conditioning

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INDUSTRIAL • COMMERCIAL • INSTITUTIONAL • PUBLIC BUILDINGS

Journal Section of the American Society of Heating and Air-Conditioning Engineers—p. 221

January 1955

DIRECTORY & SHOW NUMBER

. . . . see the yellow pages for Directory Section

UNIFORM WALL THICKNESS

for reliable service

STARTING POINT

high-grade pattern equipment
and careful setting of cores

Uniform wall thickness is certainly essential for reliable service. In high-quality pipe fittings it can generally be taken for granted. But it *cannot* be taken for granted unless the quality of the product is backed by continuous care in manufacturing and testing.

At Grinnell, continuous care is built right into the manufacturing process, with modern production methods, efficient inspection procedures, and vigilant attention to every detail.

That is why, when you specify Grinnell, you can be *sure* of—

- High quality metal
- Uniform wall thickness
- Dimensional accuracy
- Clean inside surface for smooth flow
- Proper chamfer for easy starting and protection of first thread
- Precision threads for easy running-up and tight joints

To make fittings the *strongest* link in your piping system, choose from the wide Grinnell line. Available from your local Grinnell Distributor or a Grinnell Warehouse.

GRINNELL
WHENEVER PIPING IS INVOLVED

Grinnell Company, Inc., Providence, Rhode Island • Coast-to-Coast Network of Branch Warehouses and Distributors

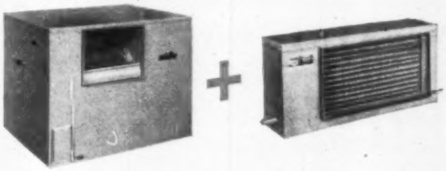
Manufacturer of: pipe fittings • welding fittings • forged steel flanges • steel nipples • engineered pipe hangers and supports
Thermolier unit heaters • Grinnell-Saunders diaphragm valves • prefabricated piping • Grinnell automatic fire protection systems

3 doggone good reasons for not missing usAIRco at the show!

Now usAIRco gives you the most complete line-up of home air conditioning equipment to hit the market! usAIRco units fit every type of home, every type of air conditioning problem! usAIRco home air conditioners have every advanced feature of design and construction . . . made possible by more than 30 years of air conditioning know-how. With usAIRco you can meet every demand of the home market, profitably!

usAIRco Kooler-aire system

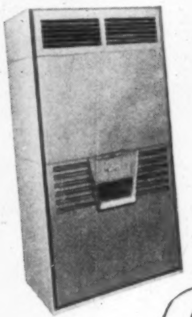
of "waterless" air conditioning



Kooler-aire operates on electricity only! Air cooled condensing unit, consisting of sealed compressor, condenser coil, blower and receiver, can be located in or out-of-doors. Unit is used in conjunction with housed cooling coil, which may be installed anywhere in outlet side of air supply system. Copper tubing carries the refrigerant from condensing unit to cooling coil.

usAIRco "packaged" air conditioner

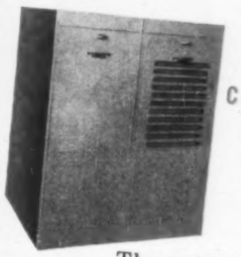
for commercial or home use



For home "add-on" installations, the usAIRco "packaged" air conditioner is quickly and easily connected to a warm air furnace. Only two simple re-duct connections are required. The home unit utilizes ductwork, blower and filters of the existing warm air heating system. For commercial use, blower and plenum sections can be added.

usAIRco Year 'round combination

home cooling and heating unit



The usAIRco year 'round combination cools, heats, filters and dehumidifies the air. Consisting of a gas fired furnace and matching air conditioning unit, this compact combination requires little more space than the average furnace. It can be installed almost anywhere . . . basement, closet or utility room. Same ducts distribute both warm and cool air.

If you cannot visit the show, write us for complete information on a profit-proved usAIRco *dealership!*

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Export: 13 E. 40th Street, New York 16, N.Y., U.S.A.

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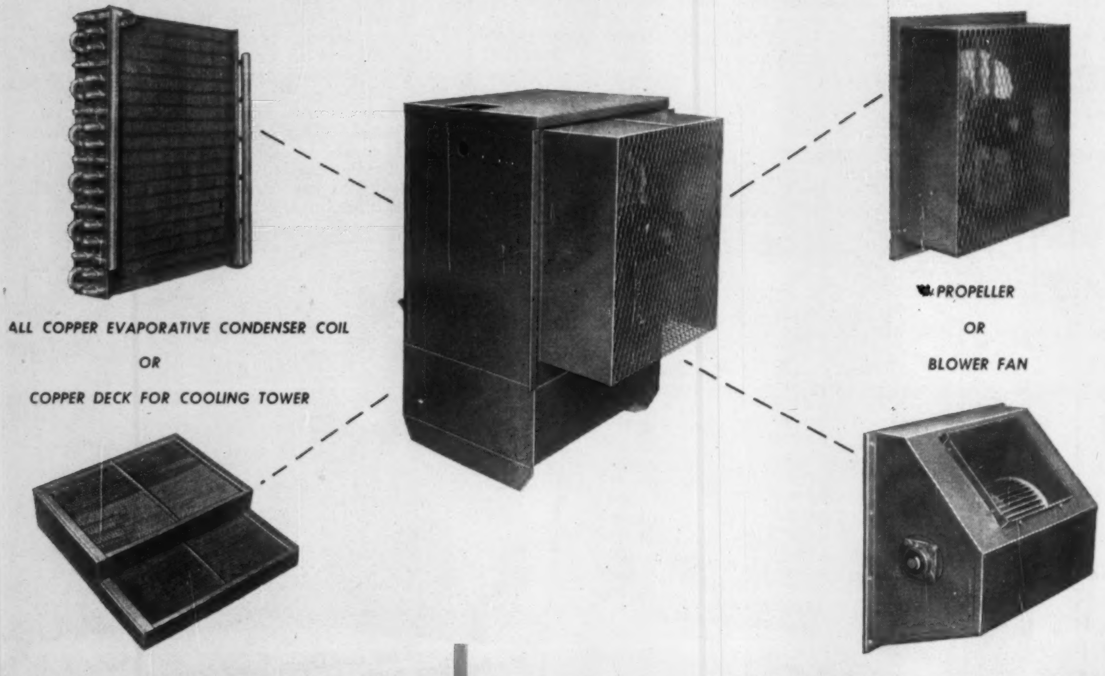
International Heating and Ventilating Exposition

PHILADELPHIA, PA.

January 24-28, 1955 Booths 58-59

AMAZING NEW 4-WAY WATER SAVERS WITH ALL COPPER WATER SURFACES...

by BUSH


ALL COPPER EVAPORATIVE CONDENSER COIL
OR
COPPER DECK FOR COOLING TOWER
PROPELLER
OR
BLOWER FAN

YOU SELECT

Inner-Fin Evaporative Condenser Coil (All Copper) or Copper Deck Cooling Tower with Propeller Fan or Blower Fan.

You'll find FLEXIBILITY in these Bush Water Savers, never before available. And Bush FLEXIBILITY enables you to maintain a *complete* stock, without being burdened with excessive inventory. Bush standardization makes this possible.

LOOK AT THESE COMBINATION POSSIBILITIES!

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A modern Evaporative Condenser by simply replacing the Copper Decking with Bush's exclusive Inner-Fin coil.

Cooling Tower or Evaporative Condenser, you'll be completely astounded by the *compact size.*

See for yourself and be convinced, by taking a look at Bush Booth No. 250 at the International Heating and Ventilating Exposition in Philadelphia, January 24 to 28.

BUSH

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Heating Piping & Air Conditioning

Vol. 27 No. 1

(with which is merged the Aerologist)

Design, Installation, Operation and Maintenance in Industrial, Commercial, Institutional and Public Buildings

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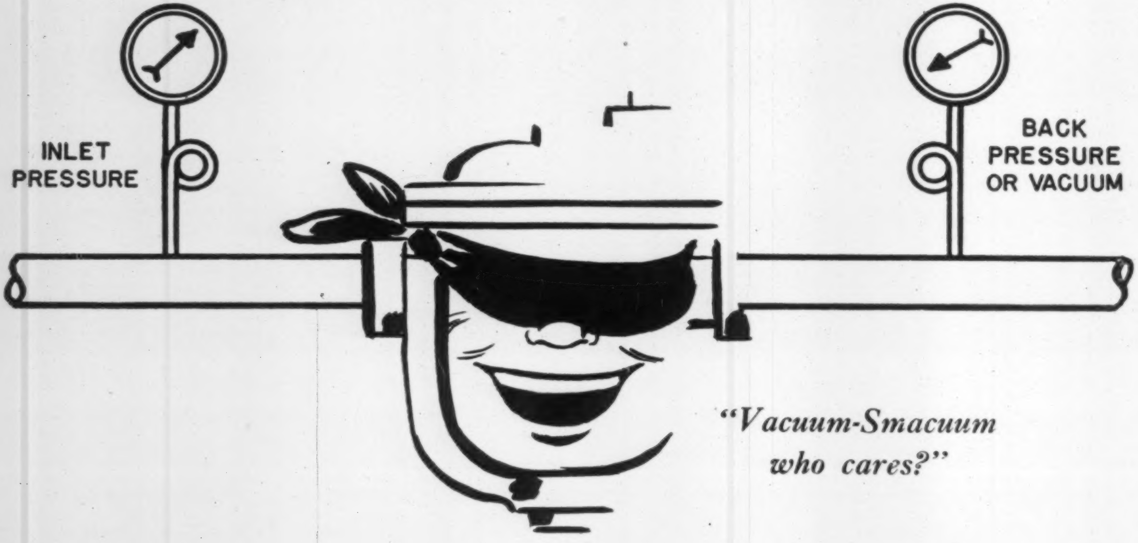
VACUUM ISN'T VACUUM

TO A STEAM TRAP

...It's Just Pressure Below Atmospheric



ONLY 2½¢ per year per trap parts costs on traps averaging 11 years of service at Globe Steel Tubes Company, Milwaukee, Wisconsin.

PRACTICALLY ZERO maintenance, complete satisfaction with traps after 12 years service on 10 lbs. pressure, 5" vacuum—Liquid Veneer Corp., Buffalo, N.Y.

BUYERS are sometimes told that steam traps for vacuum return service must be "different"—requiring, we suppose, some mysterious ability to recognize vacuum and act accordingly.

The truth is that vacuum isn't vacuum to any steam trap. It is just pressure below atmospheric pressure. All vacuum does is increase the pressure differential across the trap orifice. An Armstrong trap doesn't care whether it discharges to vacuum, back pressure or atmosphere. It works just the same in all cases.

Because Armstrong traps don't have to wait for condensate to cool, drainage is fast and equipment temperatures and BTU output are maximum.

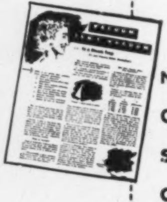
Armstrong traps won't cause you to lose vacuum. Any flash steam from their discharge is quickly condensed. *It is the leaky traps that make it hard to hold vacuum!*

The mechanisms in Armstrong traps for low pressure vacuum return service are identical in design, workmanship and materials to those used in traps for 900°F, 950 lbs. pressure. They can't help but operate a long, long time without leaking. This makes it nice for the maintenance man, too.

Fast heat-up, high temperatures, low maintenance, long life—all wrapped up in one package. Ask your Armstrong Representative to go over your vacuum heating system with you.

ARMSTRONG MACHINE WORKS
874 Maple St., Three Rivers, Michigan

***Send for 4-page Bulletin No. 223, "Vacuum Isn't Vacuum"—a complete discussion of vacuum, effect on trap selection, causes of vacuum loss, effect of flash steam, etc. Free on request. Just fill in and mail the coupon.**



ARMSTRONG MACHINE WORKS
874 Maple St., Three Rivers, Michigan
Please send Bulletin 223, "Vacuum Isn't Vacuum"

Name________________________________
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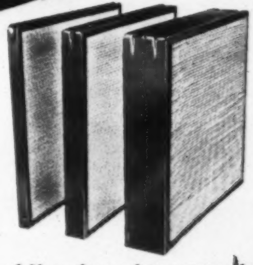
THE MEASURE OF A GOOD AIR FILTER

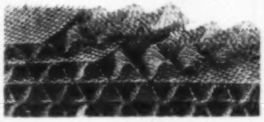
You Are Invited!
ASHVE—Booth 10

1″, 2″ or 4″ thick?



Whether you need filters for package air conditioners or furnaces, for general filtration or for special applications requiring the highest efficiency and greatest dirt capacity, Farr Company has a standard type to fit the job—available in steel, aluminum, copper, stainless and monel.

How much media?



In FAR-AIR® filters you get more media per square inch *plus* the famous herringbone-crimp design that assures greater dirt holding capacity and lower pressure loss. Firmly packed media provides even density and assures uniform high efficiency over the entire filter area.

ORIGINATORS OF FAR-AIR CERTIFIED FILTER SERVICE

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NO COMPROMISE ON QUALITY
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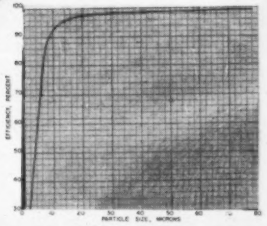
What kind of construction?

Heavy gauge filter frames and interlocking holding frames assure rigid filter banks and proper fit. Reinforcing rods drilled through the filter media make the filter more rugged. *Engineered* quality assures longer service life.

How efficient?



High efficiency in a filter is its only real reason for existence. FAR-AIR® filters consistently deliver superior performance. Send for your set of efficiency curves which show how the various types of FAR-AIR® filters will perform for you.

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P. O. Box 45187, Airport Station
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☐ Send efficiency curves
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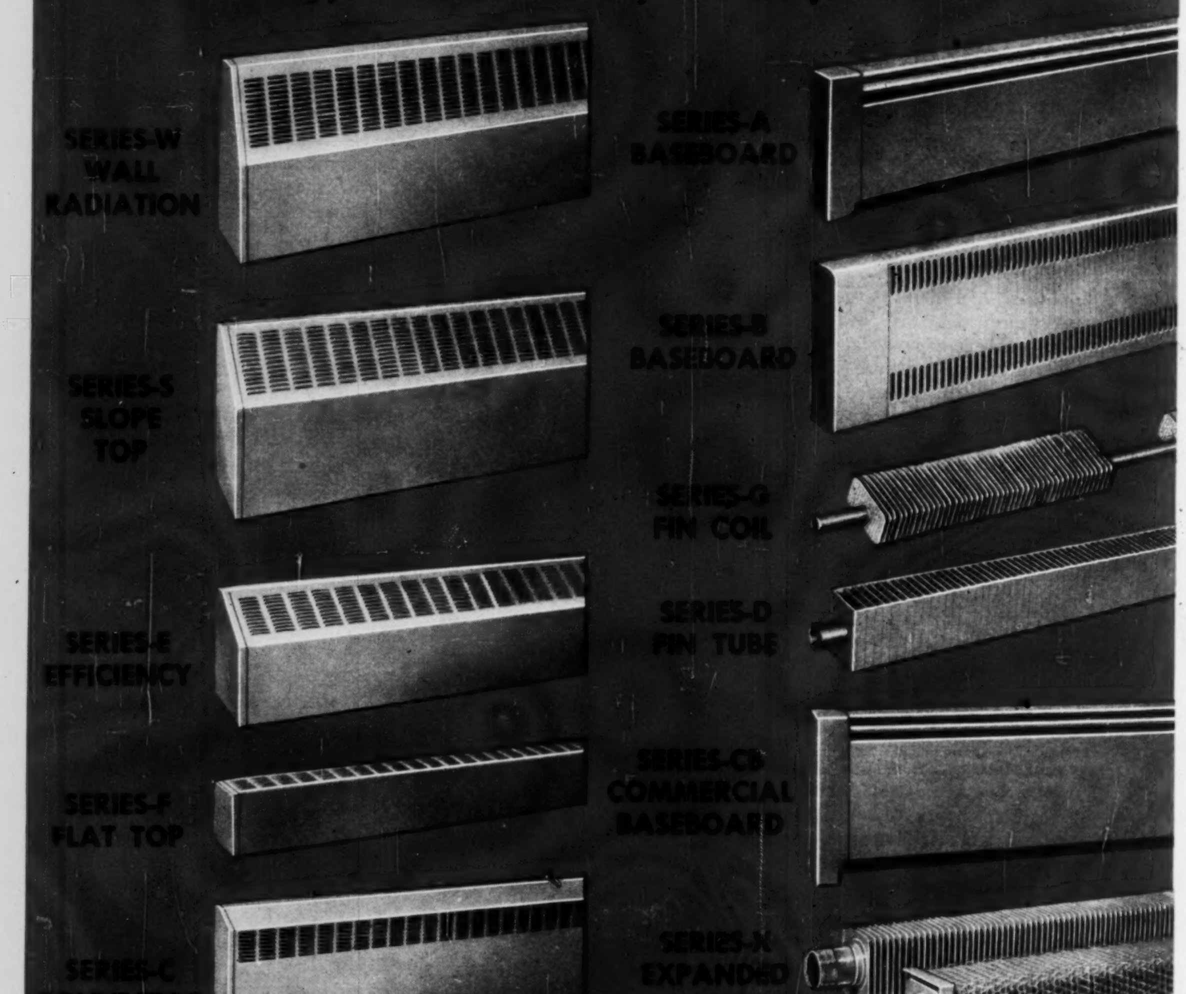
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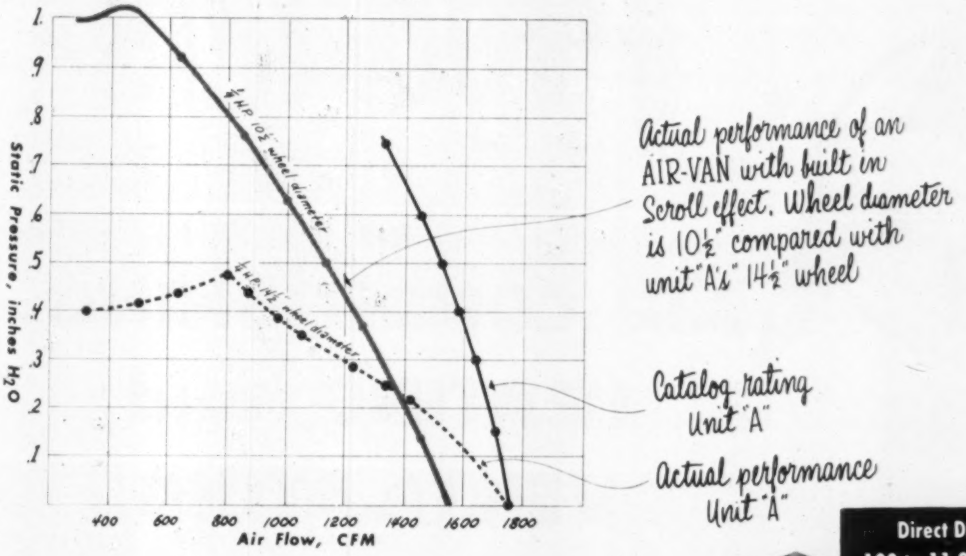
mitation is the sincerest flattery...



. . . and we're really quite flattered by the "new look" in power roof exhausters, because it's patterned after the Air Van® design we brought out in 1948.

BUT — the imitation has to end with the looks. No one else can use the scroll effect to imitate our *efficiency,* because we have it patented.

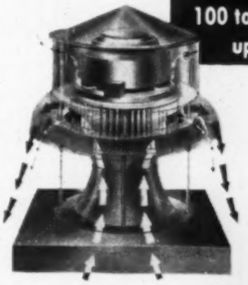
And it's the Air Van's patented scroll design that gives you really positive air removal — *developing up to four inches of static pressure.*

We've shown you this curve before, and it still applies. It shows that, where other power roof exhausters fall off, Gallaher keeps right on going.

We know this, because Gallaher units are research-designed and tested—then redesigned and retested—to the point where the tremendous ratings shown on our tables are really on the conservative side.

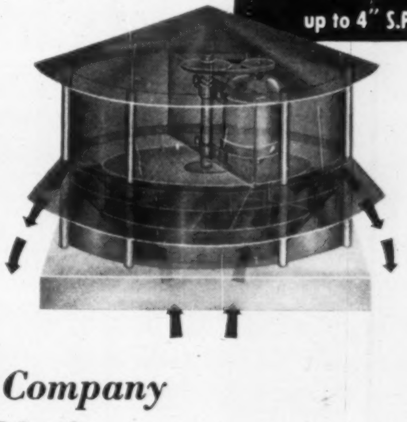
But you don't have to take our word for it. Our customers are the best salesmen we have, and if you talk to someone who has purchased a Gallaher, we think you'll agree that the Air Van can't be topped in performance.

Direct Drive
100 to 11,000 CFM
up to 4.2" S.P.



Patents 2188741 2526290
Patents pending

NEW Belt Drive 4000
to 65,000 CFM
up to 4" S.P.



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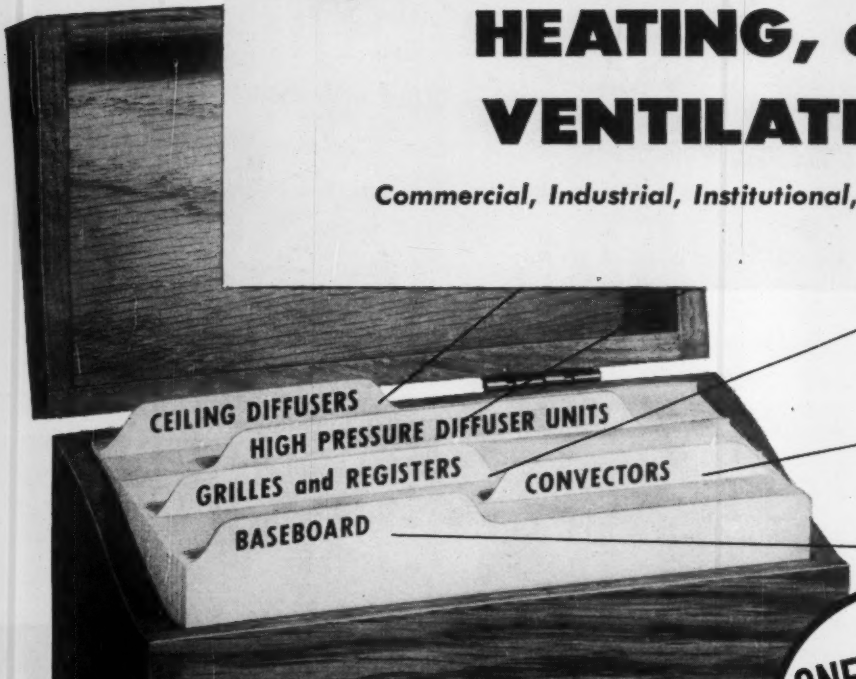
T & B

FOR

AIR CONDITIONING, HEATING, and VENTILATING

Commercial, Industrial, Institutional, and Residential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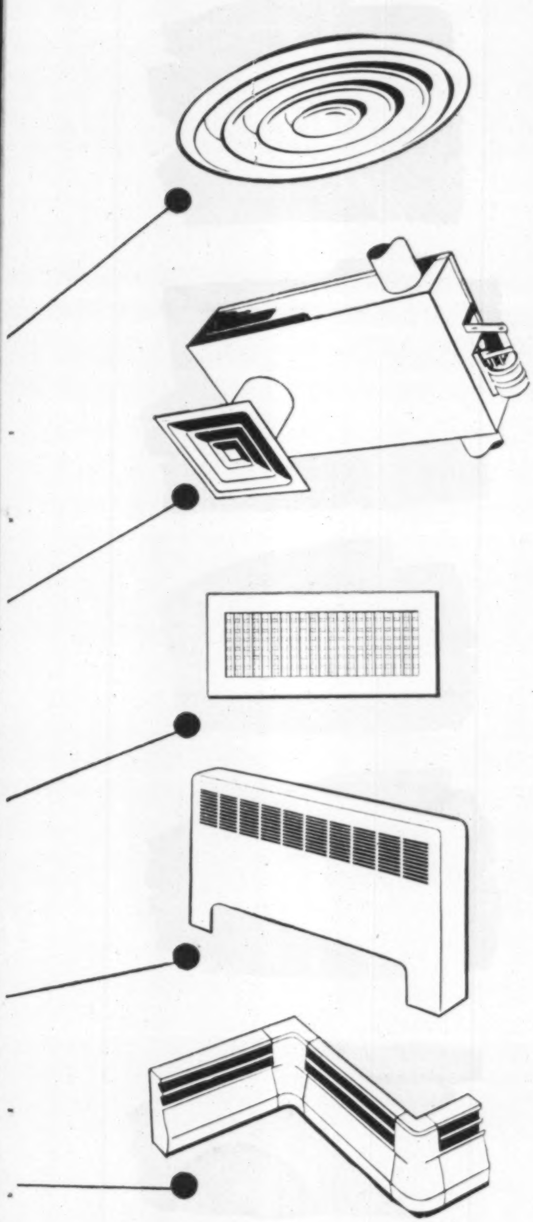
HIGH PRESSURE DIFFUSER UNITS
GRILLES and REGISTERS
CONVECTORS
BASEBOARD

ONE SOURCE
FOR
ALL FIVE



Aerofuse Ceiling Diffusers are available in a wide selection of types and sizes, styled and engineered to meet the most rigid requirements of appearance and performance at the point of air delivery.

T & B High Pressure Diffuser Units are the result of many years of laboratory experiment and practical experience in the field. Units now in operation handle branch duct velocities up to 4000 FPM, discharge air without noise or drafts.

Tri-Flex Supply Air Grilles and Registers . . . Aerovane Return Air Grilles and Registers. Standard sizes for economy and prompt delivery. Individually adjustable face bars. Registers equipped with opposed blade dampers.

T & B Convectors are widely used in homes and apartments. Two types are available . . . Type R for recessed installation . . . Type F for free standing installation. Styled for beauty, engineered for comfort.

T & B Baseboard combines the heating comfort and smart appearance essential in the modern home. Two types . . . recessed . . . free standing . . . both designed for ease of installation.

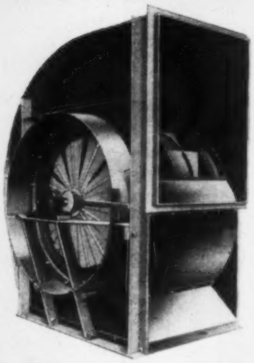
See the
TUTTLE & BAILEY
EXHIBIT
ASHVE Show, Booth 31

TUTTLE & BAILEY inc
NEW BRITAIN, CONNECTICUT

You can rely on Clarage . . .

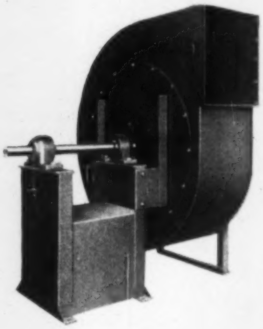
CLARAGE
Air Conditioning
Units

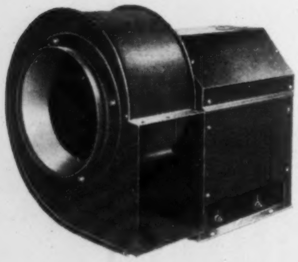
Blow-Thru Multitherms (shown) for zone control. Draw-Thru Multitherms for comfort and process applications. Capillary Conditioners for exceptional air cleaning.



CLARAGE
Air Washers and
Sprayed Coil Units

Capillary (shown) and Spray Type Air Washers for air cleaning and purification. Unicoil Units — sprayed coil equipment — for central station systems.





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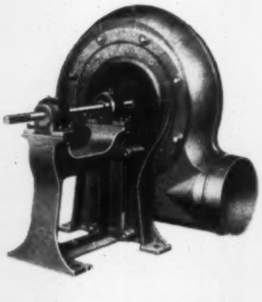
Ventilating Sets

Complete, ready-to-run units for smaller air handling requirements. Direct connected and V-belt models in 18 sizes, capacities 100 to 14,000 cfm.



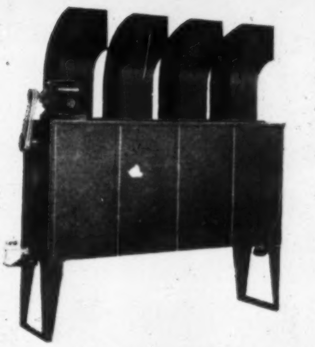
CFCo **CLARAGE FAN COMPANY . .**
Sales Engineering Offices in All Principal Cities

. . . Air Handling and Conditioning Equipment

CLARAGE

Ventilating and Air Conditioning Fans

Type NH Fans (shown) with backwardly inclined blade wheels, capacities 1,000 to 725,000 cfm. Type HV Fans with forward curved multiblade wheels, capacities 150 to 450,000 cfm.



CLARAGE

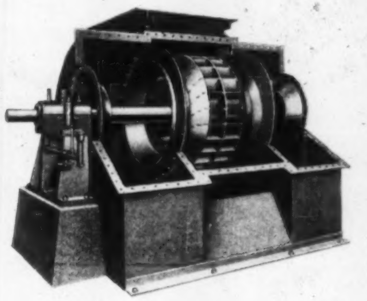
Unit Heaters

Unitherms (shown) equipped with multiblade fans, capacities 60,000 to 1,160,000 B.t.u. Clarco Heaters equipped with propeller fans, capacities 28,000 to 270,000 B.t.u.

CLARAGE

Industrial Air and Material Handling Fans

Type XL Fans range up to 130,000 cfm, 18" SP, 60" inlet diameters. Four wheel types, 16 fan sizes—smaller sizes adjustable as to discharge.



CLARAGE

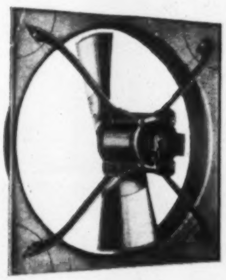
Mechanical Draft Equipment

Type RT Fans (shown) and other types of Clarage Fans are designed and constructed for induced draft, forced draft, and high pressure industrial applications.

CLARAGE

Industrial Exhausters and Blowers

Type CI Exhausters (shown) with capacities 200 to 3,800 cfm, pressures to 22". Type O Blowers with capacities 150 to 45,000 cfm at high pressures.



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Propeller Fans and Other Equipment

Propeller Fans with capacities 700 to 36,000 cfm . . . Unit Stoker Fans in a wide size range . . . Vortex Control for efficient, economical air volume regulation.

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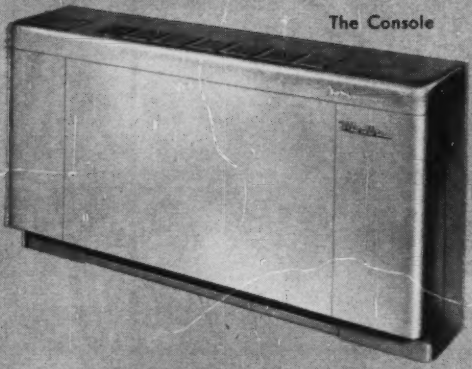
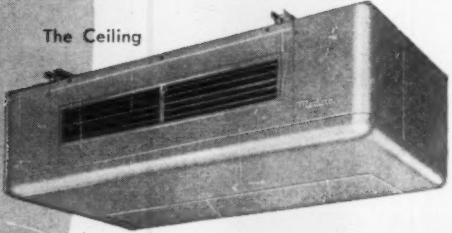
--for the finest in

choose from the advance

for hotels, apartments, institutions, homes . . .


The Console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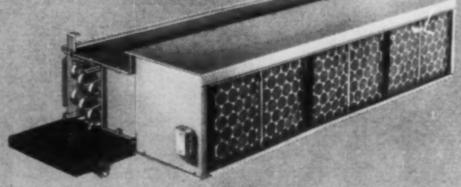
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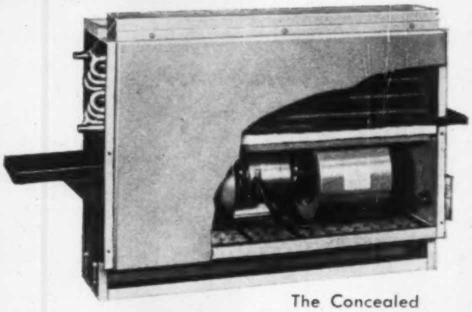
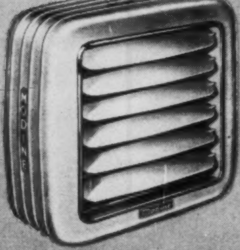
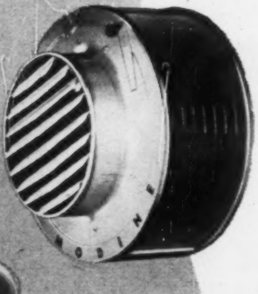

The Concealed

for hot water and steam . . . **advance engineered**





Modine UNIT HEATERS

. . . include new power-throw units

For steam, Modine builds 26 sizes of vertical (includes 13 sizes of low outlet temperature models), 19 sizes of horizontal (includes 9 low outlet temperature models), and 10 sizes of power-throw units. For hot water, Modine builds 13 sizes of vertical and 15 sizes of horizontal units.

A fully coordinated line of Modine Unit Heaters offers expanded opportunities for unit heater application. Individually or in combination, they meet exacting engineering demands of any space heating problem. Lower outlet temperatures—110°-120° zone—for balanced performance, with velocities and volume correctly related.

All Unit Heater casings are Bonderite-treated to prevent rust and bond paint to steel. Continuous-duty, totally enclosed fan type motors are rubber mounted.

Easy to install! Direct-from-pipe line suspension for low cost, fast installation of all Horizontal types. Accurately rated in strict accordance with the Standard Test Code for Unit Heaters.

air conditioning, heating, ventilation

engineered Modine line

advance engineered

Modine AIRditioner

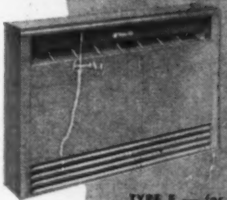
Provides cooling with chilled water, heating with hot water—from a central source—while it filters, de-humidifies, introduces and circulates fresh air. It's the unit designed to provide year-round comfort in multi-room installations . . . on a modest budget. Four-speed control on quiet motor for maximum adaptability to conditions.

Four types of AIRditioners now available. Each is offered in three sizes, rated at ⅔, 1½ and 2 tons of refrigeration (220, 440 and 640 cfm) respectively.

All Modine AIRditioners are designed and advance-engineered for fast, easy installation and quick access to all connections and parts. Casings are Bonderite-treated and finished in a semi-gloss Marine Green Primer.

advance-engineered MODINE CONVECTOR RADIATION UNITS for unmatched performance

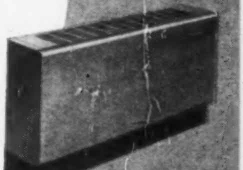
There's beauty combined with outstanding performance in Modine Advance-Engineered Convectors. And they are available in all Standard enclosure styles, as well as in heavy-duty Institutional models. Enclosures Bonderite-treated. Accurate ratings in conformance with Commercial Standard CS-140-47, as developed by the *National Bureau of Standards* and approved by the Convector Rating Committee.



TYPE F — for complete or partial recessing in wall, or for flush-to-wall installation.

advance-engineered MODINE CABINET UNITS for low-cost heating and cooling

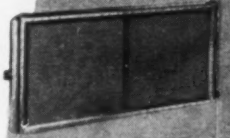
Modine Cabinet Units are Advance-Engineered to provide economical heating, cooling and ventilating. A single Cabinet Unit can provide quick, positive, quiet distribution of heated or cooled air — with or without ducts. Five different models provide (1) heating with steam or hot water and (2) cooling with chilled water in addition to heating. Various combinations permit free-standing, recessed and concealed installations — floor, wall or ceiling mounting.



TYPE BT Cabinet Unit

advance-engineered MODINE HEATING COILS for use with steam or hot water

The extensive line of Advance-Engineered Modine Heating Coils is built to meet the diversified needs of modern air-handling systems. In addition to more than 1200 cataloged heating coils for use with steam or hot water, Modine produces many custom built coils for installation in air-handling equipment produced by other firms. Types include standard and non-freeze heating and booster coils, and hot water heating coils.



Standard Heating Coil

TODAY, more than ever, look to Modine — the advance-engineered line—for the best in air conditioning and heating equipment!

Modine

. . . leading the industry for 25 years

MODINE MFG. CO., 1509 DEKOVEN AVE., RACINE, WIS.

advance engineered

Modine GAS-FIRED UNIT HEATERS weigh less . . . require less space

Actually half the weight . . . half the size . . . of the average of 7 other leading gas units producing equivalent Btu's!

As the leader in unit heating for more than 25 years, Modine brings unequalled experience to unit heating problems.

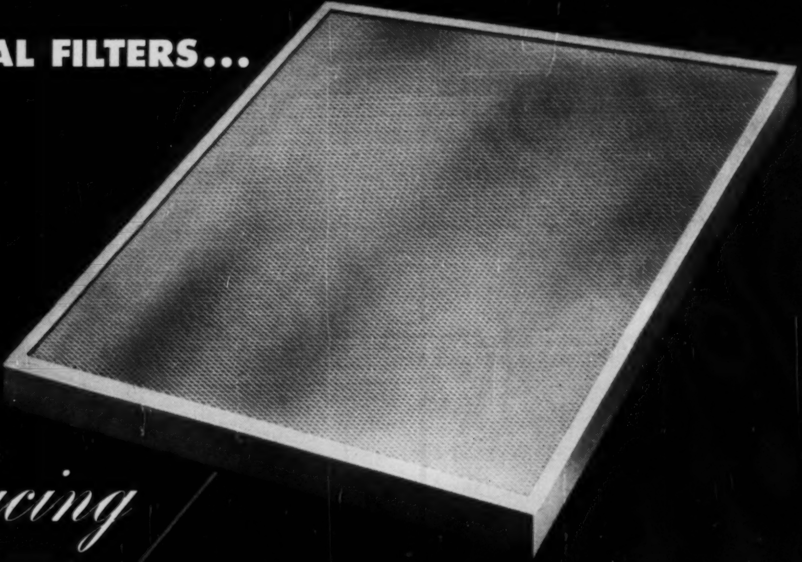
New Modine Gas-Fired Units are the *only* units with both *stainless steel burners* and a choice of stainless or aluminized steel heat exchangers. Lighter weight means easier, less expensive installation plus faster heat delivery . . . within five seconds after thermostat calls for it. And, naturally, this stainless steel design means greatest resistance to corrosion. Individually fired tubes provide higher heat transfer. Elongated ports—four times free area of conventional drilled ports—minimize clogging and simplify cleaning.

Seven sizes—from 25,000 to 220,000 Btu. A.G.A. and C.G.A. approved for natural, mixed, manufactured L.P. and L.P.-air gases.

UR-1231

For those who want less than the best in clean air... but the best in **MECHANICAL FILTERS...**

TRION



Introducing **TRION** *Mechanical Air Filters**

FEATURES

NON-CLOGGING
PROGRESSIVE LOADING
LOW PRESSURE DROP
HIGH DIRT HOLDING CAPACITY
MOST EASILY CLEANED
HIGH VELOCITY

**AVAILABLE IN 3 TYPES*

1. FIXED PANEL
2. SELF WASHER
3. TRAVELING CURTAIN

check THE EFFICIENCY RATINGS

MECHANICAL AIR FILTERS

	Test Method	Test Dust	Efficiency
Amer. Soc. Heat. Vent. Engrs.	(Weight)	Artificial	97%
Natl. Bureau Stds.	(Dust-Spot)	Artificial	58%
Natl. Bureau Stds.	(Dust-Spot)	Natural	12%

TRION, INC.
McKEES ROCKS, PENNSYLVANIA

For those who want the best

in **CLEAN AIR...**

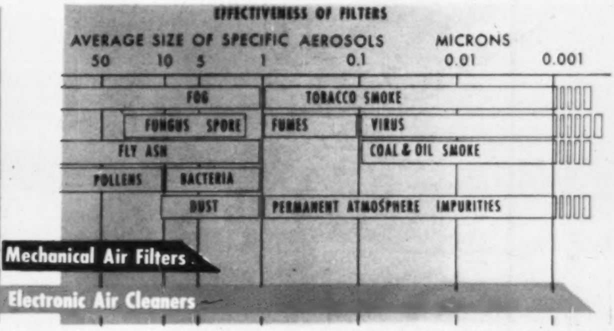
TRION ELECTRONIC AIR CLEANERS

TRION
*
TRIONIZED AIR

* TRIONized Air is more than filtered air; it is electronically cleaned air. Dust, dirt, smoke, pollen, bacteria and virus are eliminated.

ELECTRONIC AIR CLEANERS

	Test Method	Test Dust	Efficiency
Amer. Soc. Heat. Vent. Engrs.	(Weight)	Artificial	99%
Natl. Bureau Stds.	(Dust-Spot)	Artificial	98%
Natl. Bureau Stds.	(Dust-Spot)	Natural	90%



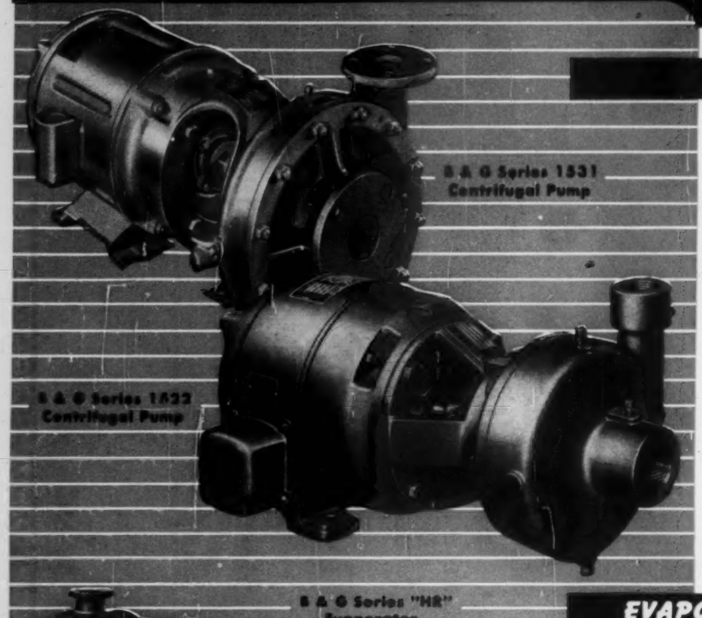
PLEASE SEND
(No Obligation)

A 1254

☐ Sample-TRION Mechanical Air Filter
☐ Literature-TRION Mechanical Air Filters ☐ Literature-TRION Electronic Air Cleaners

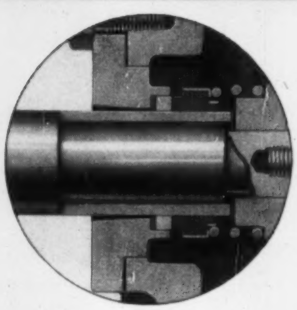
NAME__________ FIRM NAME__________
ADDRESS__________ CTIY__________ STATE__________
KIND OF BUSINESS__________

STOP HERE... FOR *Plus Values*
IN AIR CONDITIONING EQUIPMENT



EXTRA QUIET PUMPS

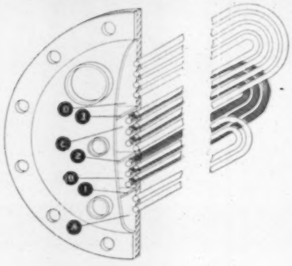
**FEATURING
WEAR-PROOF
*"REMITE"
SEAL***



B&G Series 1522 and 1531 Pumps offer an outstanding array of features for dependable, *quiet*, low-cost operation. The "Remite" Mechanical Seal, for example, ends leakage troubles. It's self-lubricating—*harder than glass*—wear-proof.

These pumps are machined to exacting specifications and carefully assembled under close inspection—in every detail designed to give long trouble-free service.

EVAPORATORS AND CONDENSERS



B & G SERIES "HR" EVAPORATOR

You'll find *plus value* in the unique design of this evaporator which prevents oil-trapping in the head passes. The lower tubes in each pass are located very close to the baffle plate, permitting any oil entering the passes to travel freely with the Freon vapor back to the compressor.

Other features include movable steel legs, for easy mounting. The shell connections extend well beyond the insulation cover—assure easy installation.

B & G CONDENSERS

B & G precision-built Condensers offer time-tested design—rugged construction—scrupulous workmanship—all combined to provide top performance over a long service life. These units are built to ASME Code U-69 regulations and are certified by Hartford Steam Boiler and Inspection Service.

- ☐ B & G Centrifugal Pumps
- ☐ B & G Evaporators
- ☐ B & G Condensers
- ☐ B & G Heat Exchangers

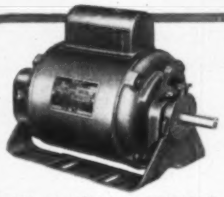
Check catalogs desired—write your name in margin and mail to us.

**BELL & GOSSETT
COMPANY**

Dept. RDS-5, Morton Grove, Illinois

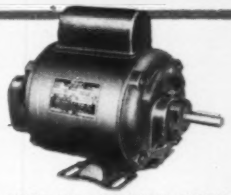
Canadian Licensee: S. A. Armstrong, Ltd., 1400 O'Connor Drive, Toronto, Canada

Here's why the Wagner Type RK Capacitor-Start Motor is the Right Kind of motor for your singlephase applications



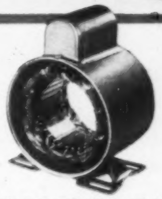
NEW 56 FRAME RESILIENT MOUNTING—This Wagner Type RK is shown in the new 56 frame that is used for ⅓, ½ and ¾ hp ratings. The resilient mounting offers unusual freedom from vibration and noise.

Smaller fractional ratings, and integral sizes from 1 through 5 hp, are also available.

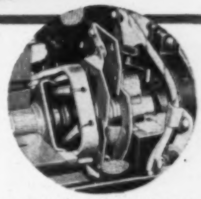


NEW 56 FRAME WITH WELDED RIGID BASE—Wagner rigid base Type RK motor, in the new 56 frame size. The formed steel base is securely welded to the rolled steel frame to produce a strong, rigid assembly that will not get out of alignment.

Type RK is also available with machined end plates for flange mounting.



THICK ROLLED STEEL FRAMES—Frames for these motors are made of thick rolled steel, with machined beads on each end which accurately position the end plates. The frames have no openings, and are treated inside and out to prevent rusting.



LONG-LIFE CENTRIFUGAL SWITCH—These motors are equipped with the Wagner-made quick-break switch that disconnects the starting winding and capacitor from the line when the motor approaches operating speed. It will make over a million starts and stops without trouble—your assurance of years and years of unfailing performance.

A lot depends on the motor you specify to power your product. The selection of a Wagner Motor will assure:

Customer Acceptance that results from the recognition of a motor built by a manufacturer with a *proven* reputation for quality motors . . .

Customer Satisfaction that results from uniform trouble-free performance and long-life operation . . .

Customer Service possible only when the motor manufacturer has the ability and the organization to provide immediate repair parts and service, *when* and *where* they're needed.

The Wagner Type RK Capacitor-start induction motor meets these requirements and offers the additional advantages shown above. That's why the RK is first choice of many leading manufacturers of machines and equipment that require singlephase motors in fractional or integral ratings up through 5 hp.

Your nearby Wagner engineer can help you select the *right* motor for your application. Call the nearest of our 32 branch offices, or write us.

Wagner Electric Corporation
EST. WE 1891

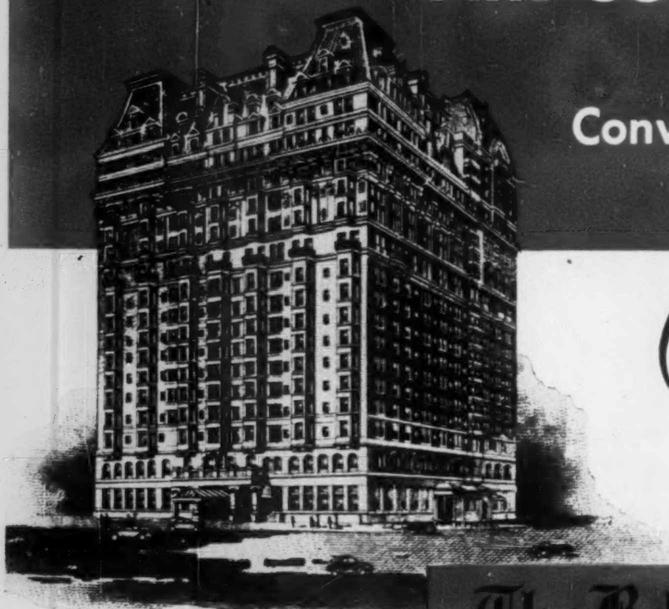
WAGNER ELECTRIC CORPORATION
6370 PLYMOUTH AVE., ST. LOUIS 14, MO., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

ELECTRIC MOTORS
TRANSFORMERS
INDUSTRIAL BRAKES
AUTOMOTIVE BRAKE SYSTEMS—AIR AND HYDRAULIC

M55 4

AIR CONDITIONING
in another ASHVE Convention Headquarters
is POWERS Controlled



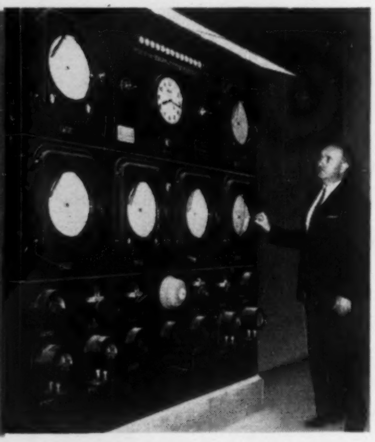
IN 1954—THE RICE HOTEL
Houston, Texas

In 1955

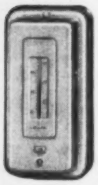
The Bellevue-Stratford
PHILADELPHIA

THALHEIMER & WEITZ, Architects, Philadelphia
COSENTINI ASSOCIATES, Consulting Engineers, New York
KERBY SAUNDERS, Mechanical Contractor, New York City

POWERS MAIN AIR CONDITIONING CONTROL PANEL



- Now celebrating its 50th Anniversary this famous Philadelphia landmark is being completely air conditioned for your comfort at the convention.



Twenty three air conditioning systems serving all public spaces in this hotel are now completed. Seventeen systems serving four hundred and fifty guest rooms are being installed. Cooling in public spaces and guest rooms is being supplied by 1400 tons of refrigeration. All are individually controlled by Powers.

Air conditioning in new or existing buildings when properly controlled is a profitable investment. One of the many superior features of a Powers system is the PACKLESS CONTROL VALVE. It eliminates packing maintenance, leakage of water or steam and gives smooth accurate control.

When you have a problem of temperature and humidity control contact Powers nearest office or write us direct.

See Powers Exhibit at Booth 433-35

Established in 1891

THE POWERS REGULATOR COMPANY

SKOKIE, ILLINOIS • *Offices in 60 Cities in the U. S. A., Canada, Mexico*

POWERS CONTROL

OUTDOOR
MASTER
CONTROL
INDOOR
SUB-MASTER
REGULATOR
COMPRESSED AIR SUPPLY
TO CONTROL VALVE
AIR FILTER
SHIELD FOR OUTDOOR CONTROL BULB
POWERS
ACCRITEM

MASTROL SYSTEM
for Forced Hot
Water Heating

Pneumatic
Switch

PNEUMATIC CONTROLS

Series 100 Recording Controller
and V-Port FLOWRITE Control Valve

PNEUMATIC
CONTROLS

Thermostat

Hygrostat

LIMITEM Thermostat

3-Way
FLOWRITE
Valve

FLOWRITE
Diaphragm
Valve
Single
Seat

Series 100
Indicating Controller

Convector and Unit
Air Conditioner Valves

Packless
Type

3" POWERSTROKE
Damper Operator

Static
Pressure
Controller

6" POWERSTROKE Damper Operator

POWERS

TEMPERATURE and HUMIDITY CONTROL

**For Heating and
Air Conditioning Systems
Industrial Processes**

**Water Heaters • Heat Exchangers
Jacket Water Cooling**

**All Types of Baths
Hospital Hydrotherapy**

No. 11
Self Operating
Temperature
Regulator

Available with
Single or Double
Seat and 3-way
Mixing Valve

Most of your control problems can be solved successfully with the aid of a POWERS engineer and the proper application of some of our modern products. Why not profit from our 60 years of experience? There's no obligation. Phone or write our nearest office.

(GH)

ACCRITEM
Temperature
Regulator

Compressed Air or
Water Operated

No. 11 Temperature
Indicating
Regulator

Self
Operating

Self-
Operating

Thermostatic
Water Mixers

THE POWERS REGULATOR CO.

Established 1891 • Offices in 60 Cities • See Your Phone Book

Factory and General Office — Skokie, Illinois

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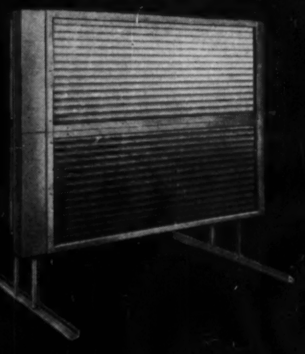
NEW YORK 17, NEW YORK • 231 East 46th Street
LOS ANGELES 26, CALIF. • 3200 West Temple St.
TORONTO 15, ONTARIO • PO Box 182, Weston
MEXICO CITY, D. F. • Apartado 63 Bis

STOP *using water!*



Eliminate all water problems with UNICON by KRAMER. Any size compressor, regardless of tonnage, can be air-cooled with UNICON.

KRAMER UNICON

Stands, hoods, and wind deflectors
are available for simplified
outside mounting
You need nothing else!

WRITE FOR BULLETIN U-210C

KRAMER TRENTON CO. • Trenton 5, N.J.

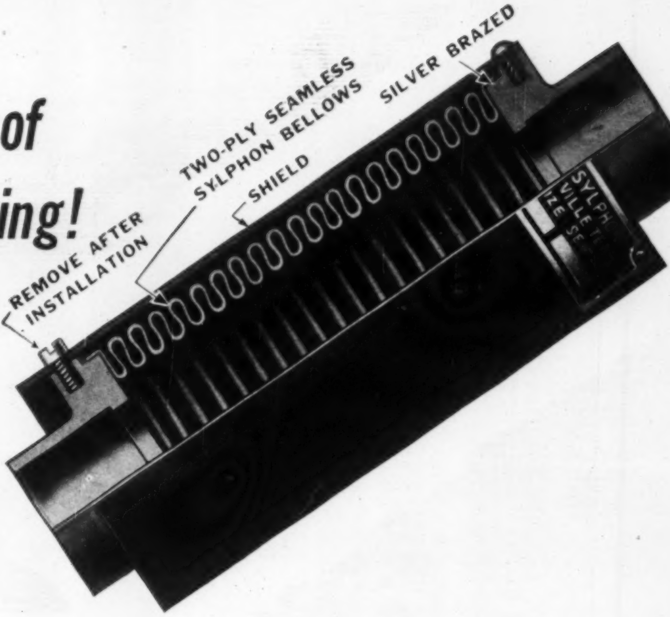
Absorbs expansion of "baseboard" heating!

SIMPLE AND COMPACT—
minimum parts

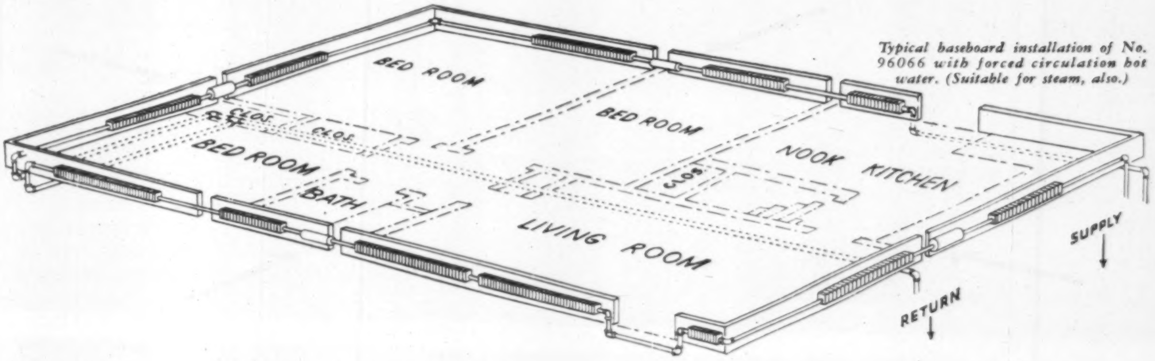
EASILY INSTALLED—
factory pre-assembled, ready to use

LEAKLESS—
phosphor deoxidized copper bellows replaces packing, prevents leaks

LOW COST


REMOVE AFTER INSTALLATION
TWO-PLY SEAMLESS SYLPHON BELLOWS
SHIELD
SILVER BRAZED

New SYLPHON Packless Expansion Joint No. 96066


BED ROOM
BED ROOM
CLOS.
CLOS.
BED ROOM
BATH
NOOK
KITCHEN
LIVING ROOM
SUPPLY
RETURN

Typical baseboard installation of No. 96066 with forced circulation hot water. (Suitable for steam, also.)

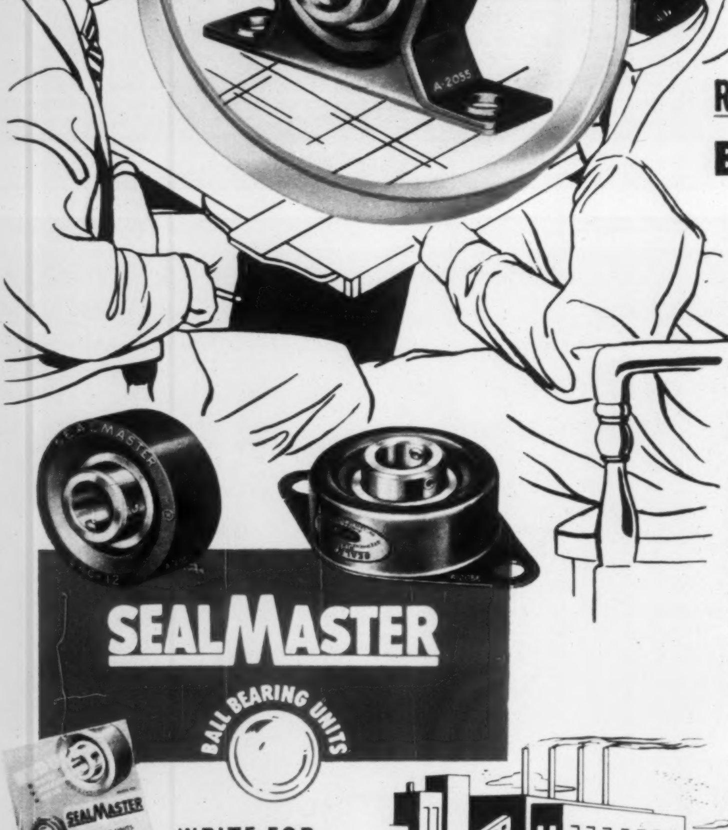
THIS NEW Sylphon Packless Expansion Joint, No. 96066, provides a simple means for absorbing expansion of "baseboard" radiation, finned tube convectors, horizontal supply lines, etc. It is ideal for both hot water and steam heating lines.

Pre-assembled at the factory, Sylphon Packless Expansion Joint No. 96066 is easy to install — horizontally or vertically. It can also be removed easily from the line. Sturdily built of corrosion-resistant materials to assure long, trouble-free service. Write for bulletin that gives full details about sizes, pressure limits, etc. Ask for Catalog AH-E

Robertshaw-Fulton
CONTROLS COMPANY

FULTON SYLPHON DIVISION • KNOXVILLE 1, TENN.

NOW... all the features the air conditioning industry has been looking for!



SEALMASTER'S

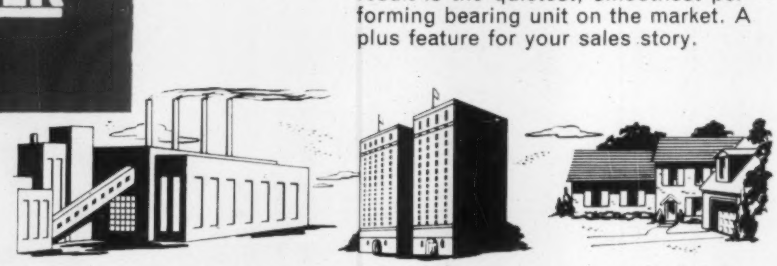
Rubber Mounted-Zone Hardened

BALL BEARING UNITS

Air conditioning has become one of America's fastest growing markets. It has also become one of the most competitive. Manufacturers continue to search for better and better features for their products—distinct selling advantages for their sales' outlets. SEALMASTER engineers, well schooled in the needs of the air conditioning industry, designed these new Rubber Mounted Ball Bearing Units with the problems of the air conditioning industry in mind. A Zone Hardened, Permanently Sealed SEALMASTER Ball Bearing Unit is mounted in a synthetic oil-resistant rubber ring which fits snugly in a pressed steel housing. (Cartridge units available for insertion in special and built-in housings.) The result is the quietest, smoothest performing bearing unit on the market. A plus feature for your sales story.

SEALMASTER

WRITE FOR FREE BULLETIN #1253.



SEALMASTER BEARINGS A DIVISION OF STEPHENS-ADAMSON MFG. CO. • 47 RIDGEWAY AV., AURORA, ILL.

Time: January 24-28

Place: Booth 639, International Heating and Ventilating Exposition, Philadelphia

NEWS: Another Dravo first in industrial warm-air space heating will be announced!

In addition, you'll see

- Dravo's floating stainless steel combustion chamber, complete with economizer tubes and swirlers
- Dravo's *Counterflo* Heater, for large industrial and commercial buildings
- Dravo's *Paraflo* Heater, for smaller industrial and commercial buildings
- Dravo's *Gas-Fired* Unit Heater, for stores, service stations and other small buildings

You'll learn—

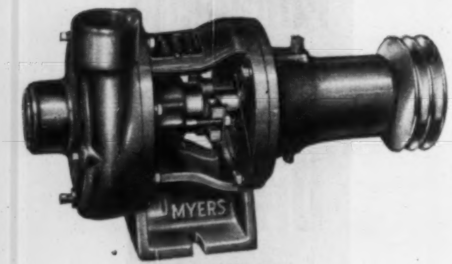
- why Dravo Heaters offer you top efficiency . . . longer service life . . . real heating economy!

Don't miss Booth 639!

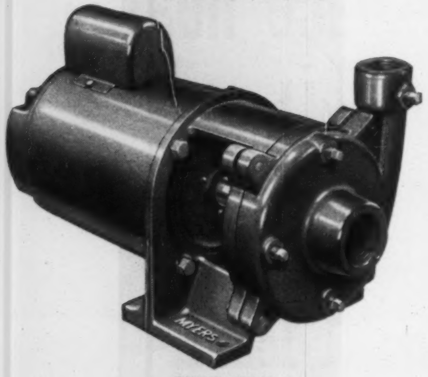
DRAVO

DRAVO
CORPORATION
PITTSBURGH, PENNA.
Sales Representatives In Principal Cities

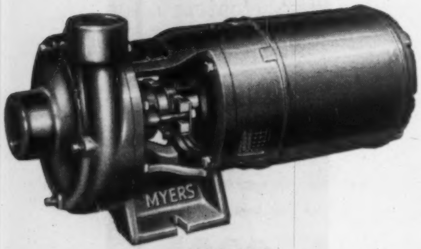
MODEL 100-B
Rotary seal only



MODEL 125-B
Shown with stuffing box
(available with rotary seal)



MODEL 100-M
Rotary seal only



MODEL 125-M
Shown with stuffing box
(available with rotary seal)

MYERS...

tops in domestic pumps,

ANNOUNCES

a complete line of centrifugals for air-conditioning application

FULL RANGE OF SIZES
⅓, ½, ¾, 1, 2, and 3 horsepower, motor-mounted or belt-driven models.

TWO CASING SIZES
1″ x 1¼″ or 1¼″ x 1½″.

ALL-BRONZE IMPELLER
Accurately balanced for smooth operation.

REMOVABLE BRONZE WEARING RINGS
Easily replaced for longer pump life.

ROTARY SEAL
Eliminates leakage (stuffing box may be specified on some models).

CORROSION-RESISTANT SHAFT
Stainless steel for trouble-free service.

CAPACITOR-TYPE MOTORS WITH BUILT-IN OVERLOAD PROTECTION
Available in single or dual voltage for single or 3-phase current.

WIDE RANGE OF CAPACITIES AND HEADS
Model with capacities to 85 GPM and heads up to 135 feet.

Myers

Write today *for performance curves and Bulletin M-787 on Myers Centri-Thrift Pumps.*

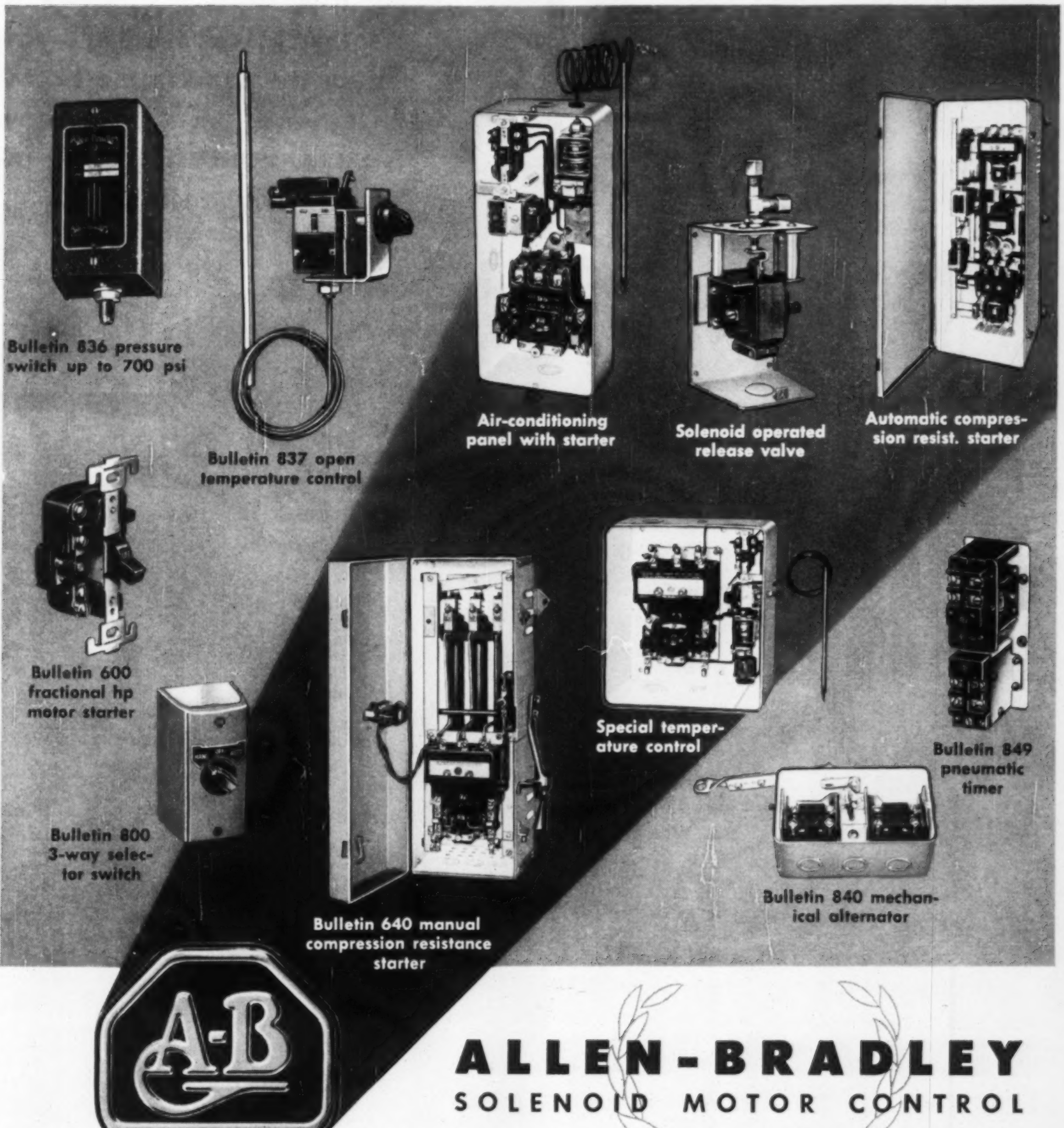
Myers **PUMPS** WATER SYSTEMS AND WATER SOFTENERS

The F. E. Myers & Bro. Co. • Dept. HP-1, Ashland, Ohio

QUALITY MOTOR CONTROLS
FOR AIR CONDITIONING AND REFRIGERATION

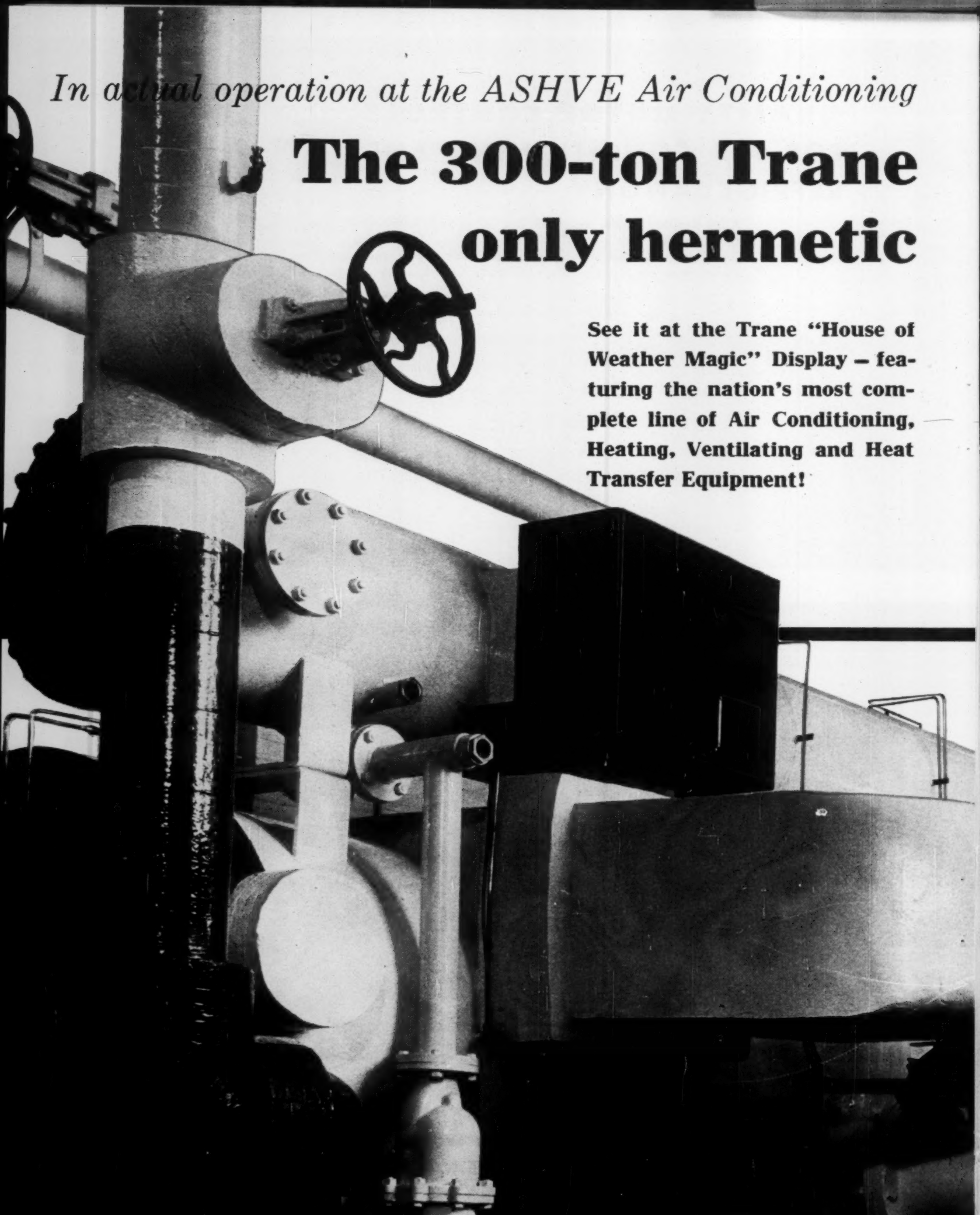
Allen-Bradley motor controls are a sound investment. They are "tops" because they are good for millions of trouble free operations. Their silver alloy contacts need no maintenance. Reliable overload protection is provided by two accurate thermal relays. Specify Allen-Bradley . . . it stands for QUALITY.

Allen-Bradley Co., 1335 S. First St., Milwaukee 4, Wis.
In Canada—Allen-Bradley Canada Limited, Galt, Ont.


Bulletin 836 pressure switch up to 700 psi
Bulletin 837 open temperature control
Air-conditioning panel with starter
Solenoid operated release valve
Automatic compression resist. starter
Bulletin 600 fractional hp motor starter
Bulletin 800 3-way selector switch
Bulletin 640 manual compression resistance starter
Special temperature control
Bulletin 849 pneumatic timer
Bulletin 840 mechanical alternator

A-B Quality

ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY



In actual operation at the ASHVE Air Conditioning

The 300-ton Trane only hermetic

See it at the Trane "House of Weather Magic" Display – featuring the nation's most complete line of Air Conditioning, Heating, Ventilating and Heat Transfer Equipment!

Exposition! JANUARY 24-28, CONVENTION HALL, PHILADELPHIA.

CenTraVac® – the industry's centrifugal compressor!

Only TRANE offers you *matched* products in *all four* fields: (1) air conditioning, (2) heating, (3) ventilating, (4) heat transfer.

TRANE products are designed and built for use *together*. And that means greater "system" dependability . . . year after year.

Make TRANE your *one source* of supply. Concentrate responsibility—simplify procurement.

Contact your nearby TRANE Sales Office, or write TRANE, La Crosse, Wisconsin.

TRANE CENTRAVAC

Here's what you'll see at the Trane "House of Weather Magic" operating display

- ★ **TRANE CENTRAVAC!** 300-ton hermetic centrifugal compressor that meets smaller load requirements by automatically throttling down to *as low as 10% of rated capacity.*
- ★ **NEW UNITRANE!** UniTrane room air conditioners *in operation!* New combination water volume and motor speed controls . . . new reversible coil and drain pans . . . new accessibility. And new, modern cabinets, more compact than ever!
- ★ **MULTIZONE CLIMATE CHANGER.** Heating or cooling for one to six zones from this one TRANE unit. Operate it yourself.
- ★ **KB UNIT VENTILATOR!** See how the revolutionary new Kinetic Barrier Action stops drafts before they start by blanketing walls of glass with a *forced upward flow* of tempered air. New 28" model in operation.
- ★ **UNIT HEATERS!** Horizontal and projection models . . . featuring TRANE's exclusive Louver Diffusers for complete control of heat distribution patterns.
- ★ **COLD GENERATOR!** See it operating with a TRANE Climate Changer. And be sure to see the unique compressor servicing display demonstrating TRANE's *interchangeability* of parts!
- ★ **NEW DELTA-FLO COIL!** Special demonstration proves greater efficiency of the new Delta-Flo Fin.
- ★ **TRANE RADIATION LINE!** Featuring the new Wall Line Convector.

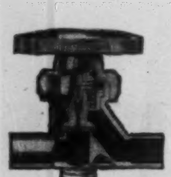
See you at the show!

TRANE

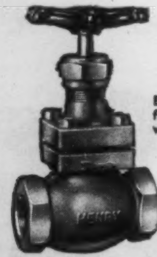
MANUFACTURING ENGINEERS

One source, one responsibility for:
Air Conditioning • Heating • Ventilating
Heat Transfer Equipment

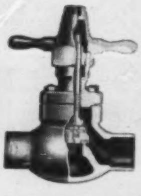
The Trane Company, La Crosse, Wis. • Eastern Mfg. Div., Scranton, Pa.
Trane Co. of Canada, Ltd., Toronto • 90 U. S. and 15 Canadian Offices



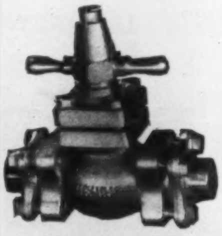
PACKLESS VALVE
With balanced-action



AMMONIA VALVE
Bolted Bonnet — screw or flanged connections. Also with screwed bonnet, sizes 1" and under



WING CAP VALVE
Non-ferrous



WING CAP VALVE
Semi-steel—with companion flanges and adapters

HENRY
VALVE
CO.
CONTROLLING
FLOW
SINCE 1914

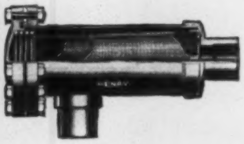
you pay—

no premium for..

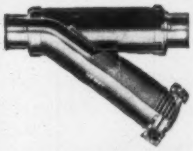
the extra advantages found in

Henry products

or for the extra satisfaction that follows their use



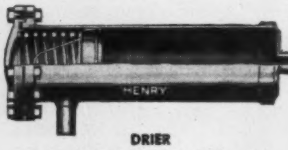
STRAINER
Angle type with patented distortion-proof flange



Y-STRAINER
Brass plated. Welded steel construction with forged brass connections. Size ⅝" O. D. S. through 4⅛" O. D. S.

BALANCED-ACTION PACKLESS LIQUID LEVEL GAUGES
Valves are backseating—diaphragms may be inspected or replaced without loss of liquid. Conforms with all safety code requirements.

CHECK VALVE
Piston Type For Freon. Sizes ⅞" through 4⅛" O.D.S.



DRIER
Cartridge type 12 to 500 cu. in. capacity. Sizes ⅜" to 2⅛" O.D.S

DRIER
Large diameter and capacity—minimum pressure drop.

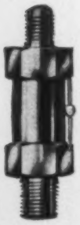
...Write for these catalogs

No. 101 Packless and packed valves, strainers, driers, check valves, relief valves, three-way valves, liquid gauge sets, flange unions and accessories for air conditioning, refrigeration and industrial uses.

No. 201 Ammonia valves and accessories.

No. 71 Drop forged and cold rolled steel fittings.

DIAPHRAGM RELIEF VALVE
Large capacity—fast positive relief and reseating action. Very small differential between opening and closing pressures.



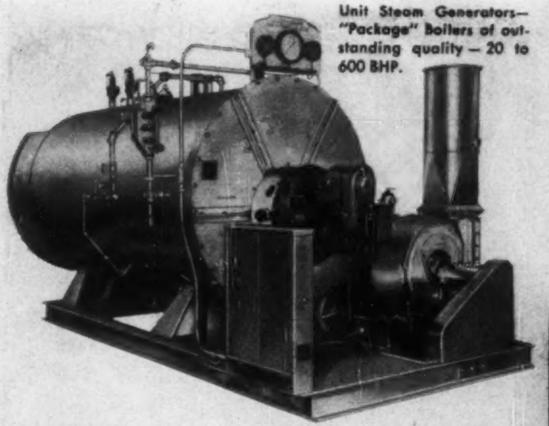
STRAIGHT-THROUGH RELIEF VALVE
Large capacity—All Brass Construction. Sizes ¼" M.P.T. through 1" F.P.T.

Stocked and Sold by Leading Jobbers

VALVES • DRIERS • STRAINERS • CONTROL DEVICES and ACCESSORIES FOR REFRIGERATION and AIR CONDITIONING and INDUSTRIAL APPLICATIONS

HENRY VALVE COMPANY

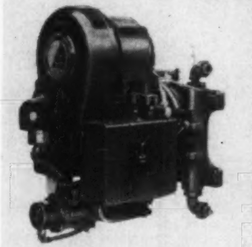
MELROSE PARK, ILLINOIS Chicago Suburb • Cable: HEVALCO, MELROSE PARK, ILLINOIS

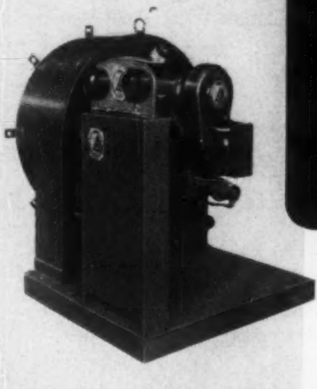

Unit Steam Generators—"Package" Boilers of outstanding quality — 20 to 600 BHP.

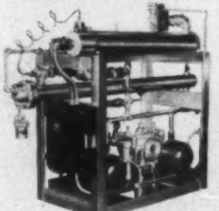
A Single Dependable Source that SAVES You Time and Money

PREFERRED UTILITIES

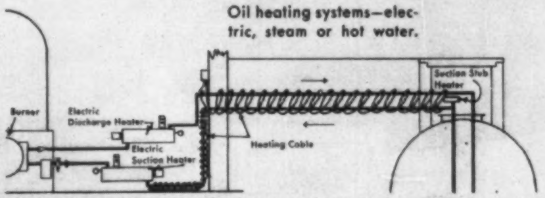
for Automatic Heating


Horizontal rotary oil burners —7½ to 175 gph. Also combination oil- gas burners.


"Thermopak"—packaged automatic oil or gas combustion system for all boilers.


Pump and heater sets—oil delivery sizes from 110 to 1200 gph.

Oil heating systems—electric, steam or hot water.



Meet Your Equipment Needs with

Unit Steam Generators
"Packaged" Burner Units
Horizontal Rotary Oil Burners
Combination Oil-Gas Burners
Fuel Oil Heaters and Preheaters—
Electric or Steam
Heating Systems for Fuel Oil Piping
Oil Pump and Heater Sets
Heavy Oil Pump Sets
Draft-A-Justors—Industrial and
Commercial
and a Complete Line of Accessories
and Specialties for Automatic Oil Burning
and Combination Oil-and Gas-Burning
Systems

Draft-A-Justors — barometric type—cut boiler stack losses.

Get the full facts on Preferred Time- and Money-Saving Equipment. Mail this coupon today.

Preferred Utilities Rigged for Results Engineered

PREFERRED UTILITIES MFG. CORP.
1860 Broadway—New York 23, N. Y.

Check the Bulletins You Want

☐ Unit Steam Generators Bulletin 2000
☐ Oil Burners—Bull. 175
☐ Comb. Burners—Bull. 176
☐ Draft-A-Justors Bulletin 800
☐ Oil Burning Accessories—Bull. 1600

NAME______________________________

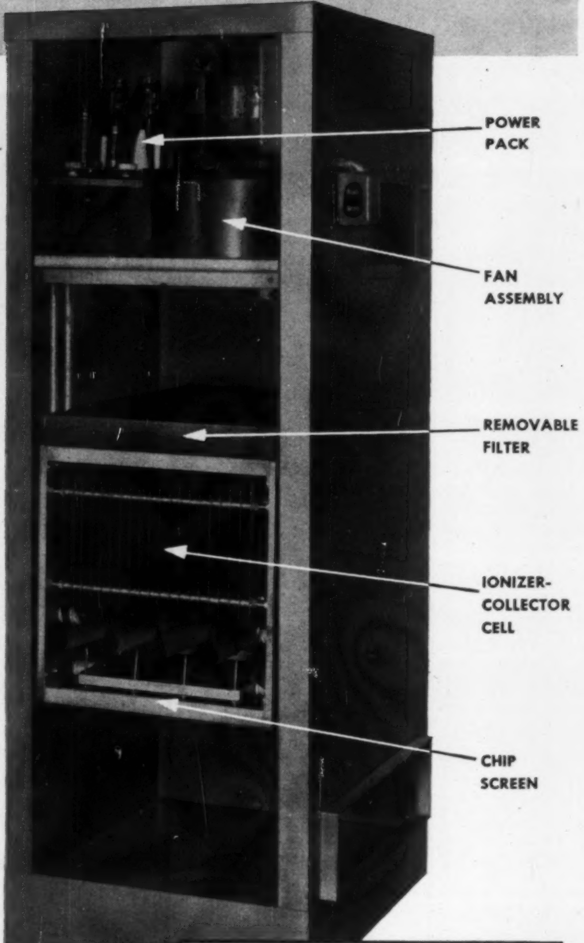
COMPANY______________________________

STREET______________________________

CITY________________STATE________

HP&AC

CLEAN AIR ELECTRONICALLY


POWER PACK
FAN ASSEMBLY
REMOVABLE FILTER
IONIZER-COLLECTOR CELL
CHIP SCREEN

NEW

Electro-Staynew MIST COLLECTOR

PACKAGED VENTILATING SYSTEM FOR MACHINE TOOLS

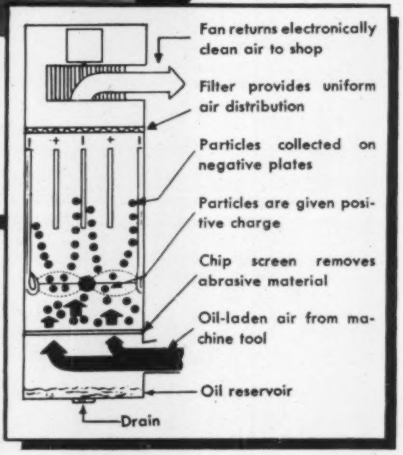
REMOVES OIL MIST AT ITS SOURCE

Specifically designed to be mounted on or near high speed machine tools, Electro-Staynew Mist Collector draws contaminated air from around grinding, cutting operations *removing over 90%* of the oil mist and smoke *electrostatically*. This self-contained, Dollinger-engineered unit distributes cleaner, purer air in the shop, cutting costs on sickness and maintenance expense. And . . . even greater savings are realized in heating costs as it is no longer necessary to exhaust contaminated air to the outside.

Look at these outstanding features!

- **UNIT CONSTRUCTION**—ionizing and collector cells are combined into one unit; thus only one unit to service.
- **EASE OF INSTALLATION**—needs only electrical and duct connections.
- **DEMOUNTABLE COMPONENTS**—all components can be easily removed without tools.
- **ADVANCED SAFETY FEATURES**—assure complete protection of personnel.
- **MINIMUM MAINTENANCE**—designed to be practically self-cleaning.

HOW IT WORKS!


Fan returns electronically clean air to shop
Filter provides uniform air distribution
Particles collected on negative plates
Particles are given positive charge
Chip screen removes abrasive material
Oil-laden air from machine tool
Oil reservoir
Drain

SEE ALL 3 ELECTRO-STAYNEW FILTERS AT THE DOLLINGER BOOTH 304 HEATING AND VENTILATING SHOW

For complete information write for

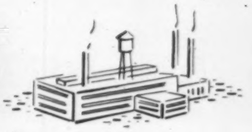
Bulletin 420—Electro-Staynew Mist Collector (above)
Bulletin 400—Electro-Staynew Industrial Precipitator (opposite page)
Bulletin 440—Electro-Staynew Home Precipitator (opposite page)

DOLLINGER
MIST COLLECTOR
ELECTRO-STAYNEW

THE Electro-STAYNEW WAY

• Eliminate SMOKE, AIRBORNE DUST, POLLEN
IN ALL TYPES OF VENTILATING SYSTEMS
WITH Electro-STAYNEW PRECIPITATORS

for INDUSTRY



Give your plant tested, economical clean air protection.

Based on the "electrostatic principle of precipitation", (+) charged dirt drawn to (−) charged collector plates, Electro-Staynew *removes more than 90% of dirt particles* and returns clean air. Dust, smoke, soot and microscopic particles (as small as 1/250,000 of an inch in diameter) are removed. Electro-Staynew improves efficiency, quality-control, and its extremely low maintenance cost makes operation economical.

Unclean Air
Mechanically Clean Air
Electronically Clean Air

for the HOME

Announcing An Electro-Staynew For A More Comfortable Home!

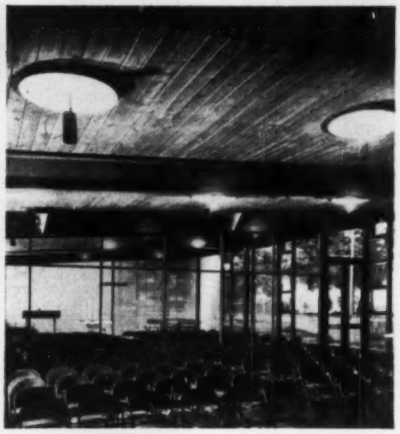
Easily installed in any forced air circulating system, the compact Electro-Staynew Home Precipitator distributes air with *over 90% dust, dirt, pollen removed.* The *same electrostatic filtration* used so successfully in other Electro-Staynew units will reduce cleaning and fuel costs. The Electro-Staynew Home Precipitator brings symptomatic relief to persons allergic to airborne particles. It's economical to operate . . . actually uses less current than a 50 Watt light bulb!

Operates on standard electric house current.

No moving parts to get out of order.

DOLLINGER CORPORATION 9 Centre Park • Rochester 3, N. Y.

ALL TYPES OF FILTERS FOR EVERY INDUSTRIAL NEED



RADIANT HEATING

the ultimate in efficiency where budgets control the building plans

• The First Methodist Church of Plainfield, Iowa, had to be more than just a church to warrant the expense of its construction. Consequently, architects Schweikher & Elting, although limited by a budget of $67,000, designed this remarkably flexible building for the local population of 1300. It includes:

- **A church assembly room for 140 worshippers.**
- **A social hall with stage that will seat up to 90 people.**
- **A 350-sq. ft. kitchen to serve the social hall.**
- **Four distinct classrooms with sliding walls. Will seat 70 persons.**
- **All the storage, office and service space required of a small community building.**
- **A complete radiant heating system of USS NATIONAL Steel Pipe.**

In such installations where efficiency is the key word, there is no better choice of materials to be made than NATIONAL Pipe—dependability at a moderate price. So dependable that architects and contractors have been specifying it for over 60 years as the "standard" for conventional plumbing and heating systems. They know that NATIONAL Steel Pipe has the inherent characteristics necessary to meet the requirements of such applications—smooth, uniform bending; sound, strong welding properties; and long service life—characteristics that have made it the largest selling pipe in the world.

For further information on the application of USS NATIONAL Steel Pipe to radiant heating and snow melting services, write:

NATIONAL TUBE DIVISION
UNITED STATES STEEL CORPORATION
PITTSBURGH, PA.
COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
PACIFIC COAST DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

USS

USS NATIONAL Steel PIPE

UNITED STATES STEEL

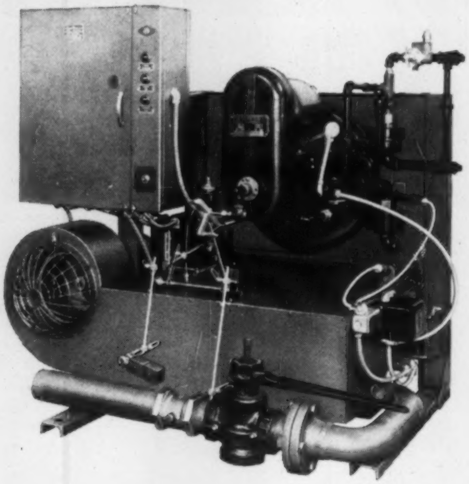
Only the Rich can afford poor heating!

McDONNELL & MILLER, *Inc.*, 3500 N. Spaulding Ave., Chicago 18, Ill.

Doing One M&M SAFETY CONTROLS *Thing Well*

Webster DUAL FUEL FIRING BURNERS

The ROTONETIC*



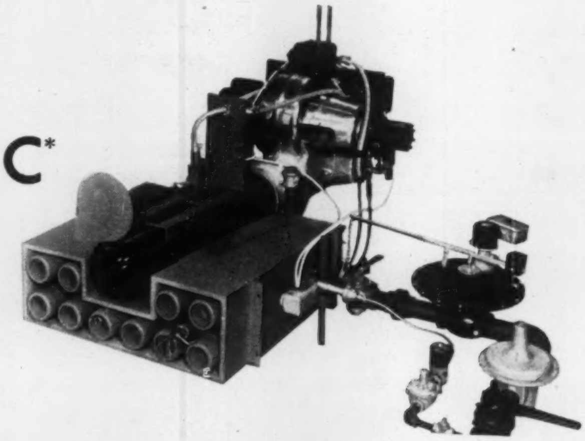
The WEBSTER ROTONETIC* is an assembly of a low pressure forced draft gas burner and a horizontal rotary cup oil burner, both of which represent the highest quality that over 50 years of combined experience can produce.

The ROTONETIC is a compact arrangement of all components necessary to burn gas or oil with SAFETY and EFFICIENCY, all factory assembled, wired, piped and tested.

Complete even to the refractory burner facing, the ROTONETIC offers the ultimate in installation simplicity with minimum time and labor.

Equal consideration has been given to both fuels in the design of the ROTONETIC so that neither fuel must suffer as a "secondary" fuel. Capacity: Gas and any fuel oil to 400 HP.

The DUONETIC*



The WEBSTER DUONETIC* now offers unsurpassed economy, efficiency and trouble-free operation in the combination oil and gas firing equipment field. Never before have both fuels been burned so well so simply. You can rely on the usual WEBSTER quality to provide you with the best. Both burners employ electric ignition; constant electric ignition on the oil burner, and electric ignition for the gas burner safety pilot. Capacity: Gas and light fuel oil to 55 HP.

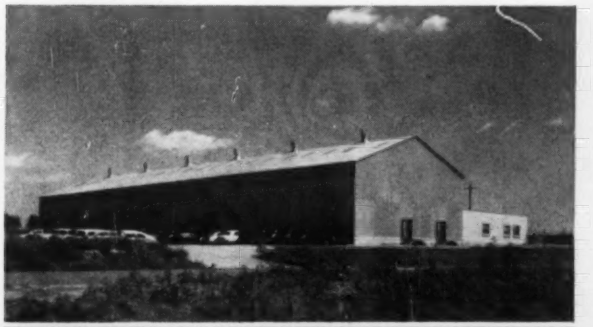
For the best in automatic combustion controls, combustion safeguard equipment or burners and accessories, contact your Webster representative.

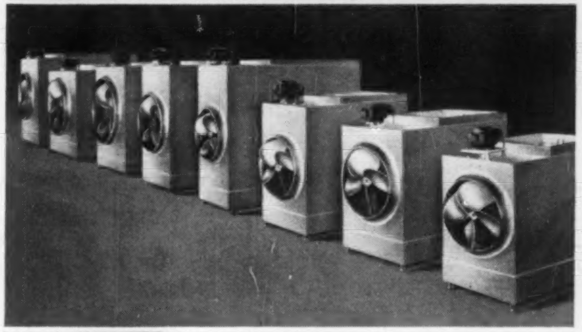
*TRADE MARK

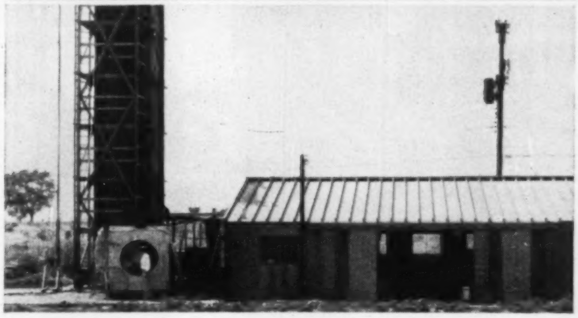
Listed by Underwriters' Laboratories, Inc.

The WEBSTER ENGINEERING COMPANY
TULSA, OKLAHOMA
Division of SURFACE COMBUSTION CORPORATION, Toledo, Ohio

The Who, What and Why of Dover Cooling Towers







WHO? In 1946, Dover Manufacturing Company began manufacturing packaged steel cooling towers for commercial and industrial use. Today, in a modern, fully equipped plant, Dover has facilities for the fabrication of all types of steel. Demand for Dover towers has increased over the years to such an extent that the company now operates with more than 25,000 square feet of plant and office space. Modernization and expansion of plant and production facilities has been only one part of the Dover plan. To this has been added the latest methods and techniques in the design, engineering and construction of cooling towers.

WHAT? Dover offers, for the first time at no extra cost, a cooling tower that is hot-dip galvanized *after* fabrication. Dover, and only Dover, provides this outstanding rust-preventing feature in packaged cooling towers at the same price as ordinary painted towers. This feature is not an "extra," but is standard finish on all Dover Series "CF" towers. Hot-dip galvanizing puts an end to troublesome, costly rust problems. The Series "CF" packaged steel, induced draft, propeller-type cooling towers provide trouble-free performance for indoor and outdoor water cooling where capacity is from 2 to 100 tons. These towers are ideally suited for air conditioning and refrigeration installations as well as for jacket water or air compressor cooling. Other Dover towers include the Series "SR" Natural Draft Redwood towers for capacities of from 3 to 108 tons.

WHY? You get low-cost cooling efficiency because Dover towers minimize operating and maintenance costs. Neat, modern design is an integral part of the rugged construction. What's more, you get *guaranteed* delivery of rated thermal capacity. All Dover tower models have been pre-tested under actual operating conditions in a modern testing lab. In this complete testing laboratory at the Dover plant, towers are tested for various decking arrangements, air delivery, and the economy and practicability of fabrication. Every condition under which the towers are tested is completely and automatically controlled for precise measurement.

DOVER COOLING TOWERS AVAILABLE FOR IMMEDIATE DELIVERY

Stocks of Dover packaged steel cooling towers are maintained in four parts of the country, providing fast delivery to all locations.

There is a Dover representative near you . . . contact him today, or simply fill out the coupon below.

DOVER
MANUFACTURING COMPANY
INDEPENDENCE, MISSOURI

ARIZONA, Phoenix
Karlson Machine Works
ARKANSAS, Little Rock
Mullins Engineering Co.
CALIFORNIA, Los Angeles
Robert R. Derber Co.
San Francisco
The Fulcher Co.
COLORADO, Denver
Burson Sales, Inc.
DISTRICT OF COLUMBIA, Washington
Randall S. Stover
FLORIDA, Jacksonville
H. L. McMurry & Co.
GEORGIA, Atlanta
Hairston & Co.
ILLINOIS, Chicago
Maxwell F. May, Inc.
INDIANA, Indianapolis
Barton Distributing Co.
KENTUCKY, Louisville
Mundt-Brawner-Branson
LOUISIANA, New Orleans
Bryner-Spranley, Inc.
MASSACHUSETTS, Boston
Flagg, Brackett & Durgin
MICHIGAN, Detroit
Young C. Smith & Co.
MINNESOTA, St. Paul
Northwestern Power Equipment Co.
MISSOURI, Kansas City
Ralph S. Beeson
St. Louis
C. E. Malone Co., Inc.
MONTANA, Butte
Sullivan Valve & Eng. Co.
NEBRASKA, Omaha
The Walling Co.
NEW YORK, Buffalo
T. F. Killeen Co.
New York
Water-Saver Corp.
NORTH CAROLINA, Greensboro
Hoffman & Hoffman Co.
OHIO, Cincinnati
Wilcox Eng. Co.
Cleveland
T. R. Eberwine Co.
Columbus
Industrial Sales Co.
OREGON, Portland
Brod & McClung
PENNSYLVANIA, Philadelphia
Thermecon, Inc.
Pittsburgh
Bristal Metal Products Co.
TENNESSEE, Memphis
Holmes Eng. Co.
TEXAS, Dallas
Sam E. Lee & Son
El Paso
Phillips-Moore Equip. Co.
UTAH, Salt Lake City
The Lang Co.
VIRGINIA, Richmond
Power Equipment Co.

Dover Manufacturing Company
Department 100, 3117 Weatherford Avenue
Independence, Missouri

☐ Please send me additional information about Dover steel cooling towers.

☐ Please have a Dover representative call on me.

Name______________________________

Firm______________________________

Address____________________________

City________________ Zone____ State__________

AAF ANSWERS YOUR

AIR FILTERS

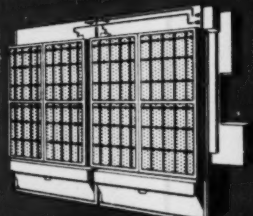
FOR over 30 years, American Air Filter and its Herman Nelson Division have concentrated on making AIR a better commodity for home, school and industry. The products pictured here are only a portion of the complete AAF—Herman Nelson line. Each was developed to meet a specific need; solve a definite problem.

AAF's line-of-product approach to your air problems assures both coordinated planning and lower over-all costs. To avail yourself of this complete service, just call your local AAF representative. He is listed in your Classified Directory.

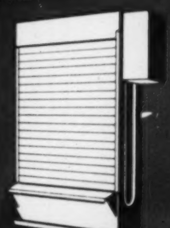
Let's Talk It Over in PHILADELPHIA!

A varied display of products plus a warm welcome from home office and field representatives awaits you at AAF Booths C116, 118, 122, 126 and 130.

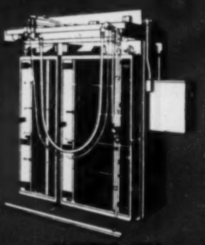
Heating and Ventilating Exposition
January 24-28



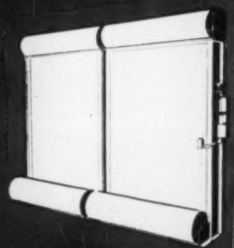
ELECTRO-MATIC
Electronic, Self-Cleaning Precipitator



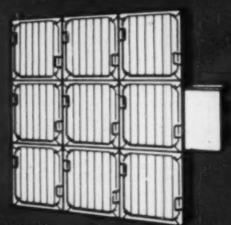
MULTI-DUTY
Self-Cleaning Air Filter



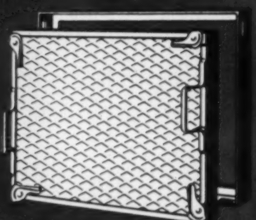
ELECTRO-CELL
Cell-Type Precipitator
With Type H Washer



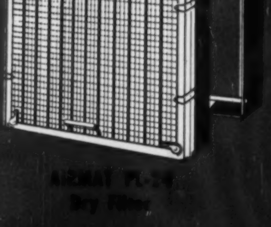
ROLL-O-MATIC
Automatic, Renewable Media
Air Filter



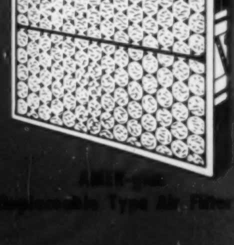
ELECTRO-PL
Dry-Type Electronic Filter



TYPE M/W-NV UNITS
Washable Unit Filters



AIRMAT PL-24
Dry Filter

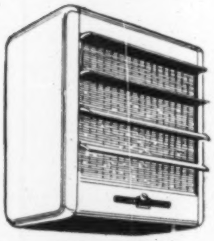


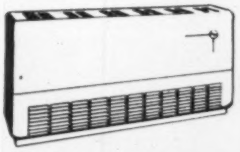
AMER-glas
Replaceable Type Air Filter

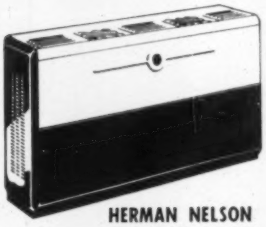
. . . pioneers in Air Care . cleaning, heating and moving air

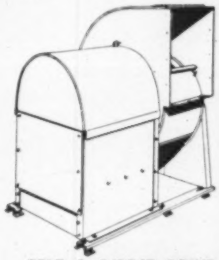
AIR PROBLEMS!

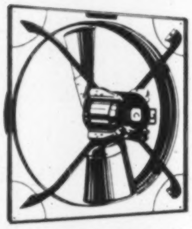
HEATING AND VENTILATING PRODUCTS

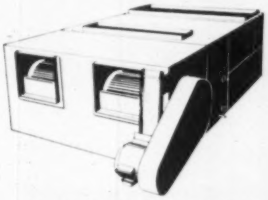

UNIT HEATERS
For Steam, Hot Water and Gas


CONSOLE HEATERS

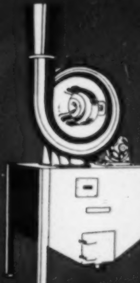

HERMAN NELSON
UNIT VENTILATORS

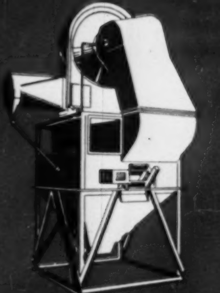

BELT & DIRECT DRIVE
UNIT BLOWERS

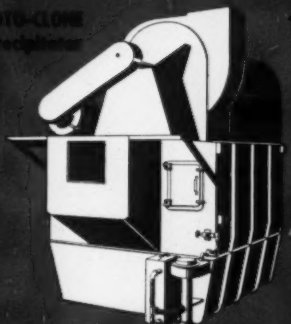

BELT & DIRECT DRIVE
PROPELLER FANS

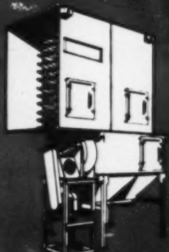

HEATING AND VENTILATING
UNITS

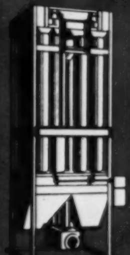
DUST CONTROL EQUIPMENT


Type D ROTO-CLONE
Dynamic Precipitator


Type W ROTO-CLONE
Dynamic Precipitator


Type N ROTO-CLONE
Hydro-static Precipitator


AMERclone
Dry Centrifugal Collector


AMERjet
Fabric Dust Arrester

AAF

herman nelson

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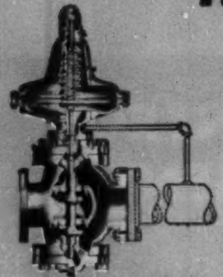
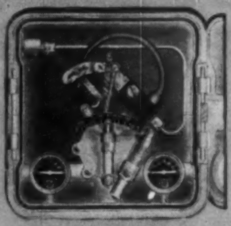
COMPANY, INC.

American Air Filter of Canada, Ltd., Montreal, P. Q. • 373 Central Avenue, Louisville 8, Kentucky

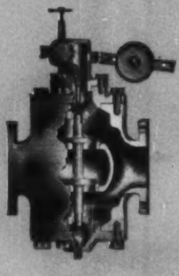
For Precise Accuracy...Quality of Manufacture...
And Outstanding Performance...



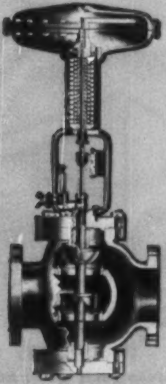
Pressure Reducing Valves



Pressure Controllers

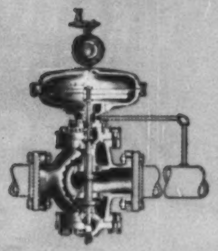


Lever Valves

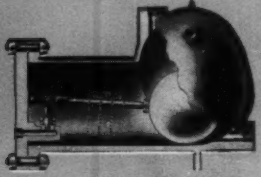


Diaphragm Control Valves

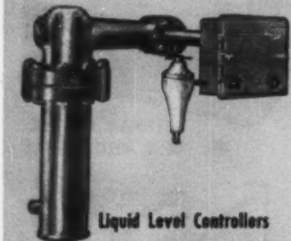
Supply Regulators



Pressure Reducing Regulators



Continuous Drainers



Liquid Level Controllers

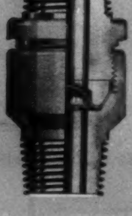
Specify BS&B "Climax" Controls And BS&B Safety Heads!

BS&B "Climax" Controls and BS&B Safety Heads are world-renowned among men in heating, power and air conditioning for their precise accuracy, superior quality and outstanding performance! Manufactured to the most exacting tolerances to comply with today's and tomorrow's newest concepts of automatic safety and process controls, they should be your *first choice* when specifying equipment for a new installation, or for replacement purposes. Call in your BS&B Representative —or write for detailed information!

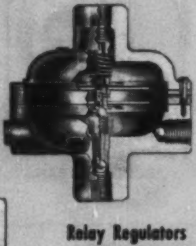
BS&B Service Is Close To You!

★ ***84 Sales Centers*** ★ ***40 Stocking Points***

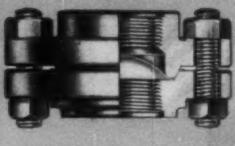
EFFICIENCY
OVER 60 YEARS
BS&B
RELIABILITY



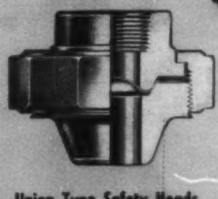
Screw Type Safety Heads



Relay Regulators

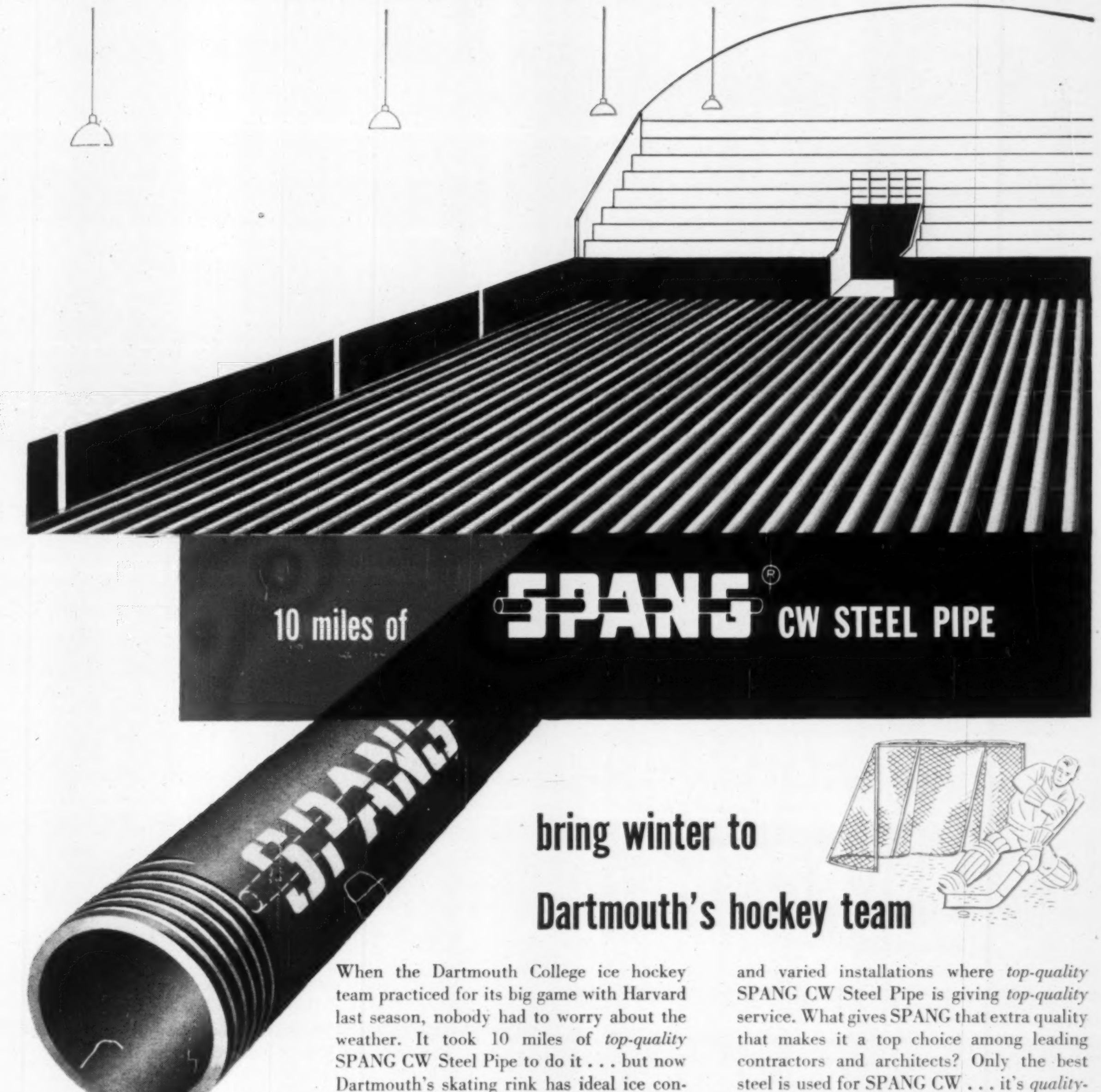


Bolted Type Safety Heads



Union Type Safety Heads

BLACK, SIVALLS & BRYSON, INC.
Climax Controls Division, Dept. 4DZ1
7500 East 12th Street Kansas City 26, Missouri



10 miles of SPANG® CW STEEL PIPE bring winter to Dartmouth's hockey team

When the Dartmouth College ice hockey team practiced for its big game with Harvard last season, nobody had to worry about the weather. It took 10 miles of *top-quality* SPANG CW Steel Pipe to do it . . . but now Dartmouth's skating rink has ideal ice conditions no matter how warm the weather.

In the new artificial ice system, made possible by contributions of alumni and friends, cooling brine is circulated through *top-quality* SPANG pipe by Frick ammonia refrigeration equipment. SPANG extra-heavy one-inch steel pipe, resting on steel supports and covered with sand, loops in parallel across the 16,000 ft rink area. Cold brine, pumped through the pipe, chills the sand so that water sprayed on its freezes immediately.

Here is just one more example of the many and varied installations where *top-quality* SPANG CW Steel Pipe is giving *top-quality* service. What gives SPANG that extra quality that makes it a top choice among leading contractors and architects? Only the best steel is used for SPANG CW . . . it's *quality-controlled* throughout manufacture . . . and the finished product is *doubly* inspected assuring you the finest pipe for heating, plumbing, air conditioning, radiant heating and snow melting systems. *Top-quality* SPANG CW Pipe is easier to cut, thread, weld and bend, making installation faster and keeping costs lower.

When you're buying pipe, specify SPANG CW Steel Pipe. Write for complete information and for the name of your nearest SPANG Distributor.

Owner:	Dartmouth College
Piping Contractor:	Frick Co., Waynesboro, Pa.
General Contractor:	Trumbull-Nelson Co., Inc., Hanover, New Hampshire

SPANG

SPANG-CHALFANT

DIVISION OF THE NATIONAL SUPPLY COMPANY

General Sales Office: Two Gateway Center, Pittsburgh, Pennsylvania. District Sales Offices: Atlanta, Boston, Detroit, Houston, Los Angeles, New York, Philadelphia Pittsburgh St. Louis.

CUT INSULATING TIME . . . .
AND CO$T

with BALDWIN-HILL

MONO-KOVER

ONE PIECE PIPE INSULATION

Just spread each six-foot section over the pipe and it snaps into place. It doesn't splinter or crumble when cut — makes no mess to clean up. Such ease of handling saves up to 50% in time and cost. Take the B-H MONO-KOVER short-cut to fast completion of jobs and you'll find many more profitable installations coming your way.

MONO-KOVER
BALDWIN-HILL COMPANY

B-H MONO-KOVER AVAILABLE WITH VAPOR-BARRIER JACKET

Send for MONO-KOVER illustrated bulletin with complete data on how to apply, properties, efficiency, selection help, size and thickness tables.

BALDWIN-HILL COMPANY

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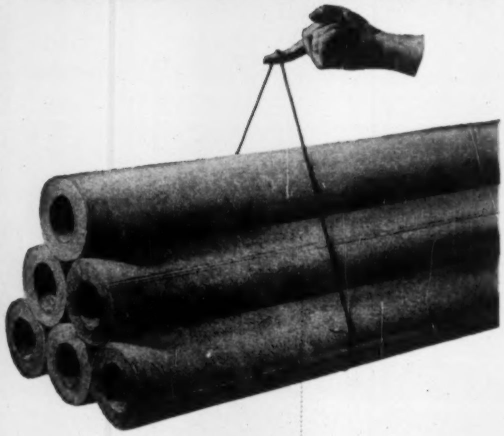
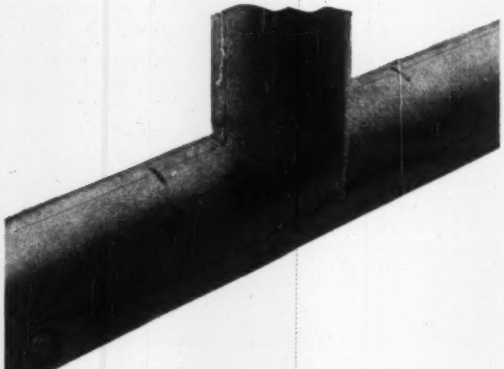
Kalamazoo, Mich... Huntington, Ind... Temple, Tex.

It's a SNAP to Apply



B-H MONO-KOVER is 4 to 10 times lighter than other types of pipe insulation. For example: a 6-foot section 1″ thick for 2″ pipe weighs approximately 1½ lbs. 96 lineal feet packaged for shipment, weigh only 29 lbs.

Firm, tough and resilient — but not rigid or hard — B-H MONO-KOVER is cut easily with a knife. No hack-sawing or hole-sawing is necessary. And there's less handling because of its one-piece construction.

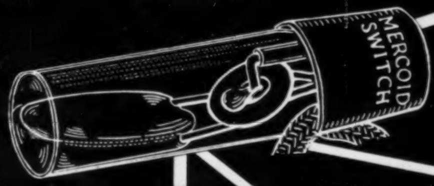


The insulation of fittings and pipe joints is simplified by the use of B-H MONO-KOVER because it is so easy to cut and fit.

MERCOID® CONTROLS

FOR PRESSURE, VACUUM, TEMPERATURE, LIQUID LEVEL

MERCOID
MERCURY SWITCH EQUIPPED
CONTROLS ARE AVAILABLE
FOR EVERY TYPE OF
SERVICE



MERCOID SWITCH

FOR GENERAL
PURPOSE
(Nema 1)

WEATHERPROOF
FOR OUTDOOR
SERVICE
(Nema 1A, 2, 3, 4)

EXPLOSION-PROOF
FOR HAZARDOUS
LOCATIONS
(Class 1, Group D.)
(Class 2, Group E, F, G.)

MERCOID CONTROLS FEATURE
VISIBILITY OF "ON-OFF" CIRCUIT
VISIBLE CALIBRATED DIAL
OUTSIDE ADJUSTMENT—
NO TOOLS REQUIRED
NO CONTACT CLEANING
TWO-WIRE HOOKUP

THE MERCOID CORPORATION
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CONSULT YOUR WHOLESALER

- Temperature and Pressure Relief Valves
- Steam Boiler Water Level Controls
- Hot Water Heating Regulators
- A.S.M.E. Listed Relief Valves for Hot Water Boilers
- Water, Steam or Air Pressure Reducing Valves
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WATTS REGULATOR COMPANY LAWRENCE MASSACHUSETTS

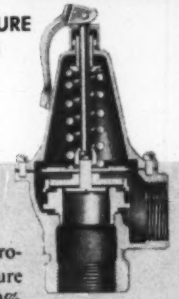
Manufacturers of.. Automatic Temperature and Pressure Regulating Safety Devices

THE LARGEST, MOST COMPLETE LINE OF ITS KIND IN THE WORLD

Hot Water Heating Safety Valves and Controls

ASME RATED WATER PRESSURE RELIEF VALVES

No. N74



174 Series

The ¾" x 1" N74 provides adequate pressure protection for about 80% of all hot water space heating installations. The 174 series in sizes 1" to 2" is applicable to institutional, industrial, and commercial installations. Female connections.

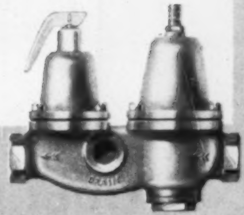
AUTOMATIC PRESSURE FEED WATER REGULATOR

No. 135HW

Automatically supplies water as needed to maintain minimum system pressure under normal operating conditions. Factory set to deliver 15 lbs. but may be readjusted as required. All bronze body with renewable seat and copper screen strainer. Also excellent for air service. Sizes: ½", ¾", and 1".

DUAL CONTROL

No. 45A

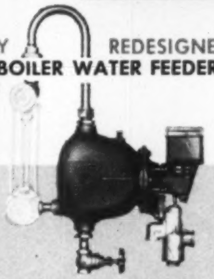


High feed capacity, automatic, combination reducing valve and relief valve for hot water heating systems. Fast feed eliminates need of by-pass. Automatically supplies make-up water as needed. Relief valve has steam discharge feature. Set to deliver 12 lbs. and relieve at 30 lbs. Adjustable. Size: ½" female connections.

Steam Heating Boiler Water Level Controls

NEWLY REDESIGNED
COMBINED BOILER WATER FEEDER & CUT-OFF

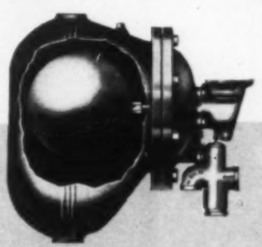
No. 60LWD



Features a mercury type cut-off switch, stickage-proof disc-to-metal seating that will not leak, and gate type drain valve. For automatically fired boilers up to 5,000 sq. ft. radiation. Max. steam pressure, 35 lbs. Max. water pressure, 150 lbs. Water connection ½". Water feeder only No. 60.

BOILER WATER FEEDER

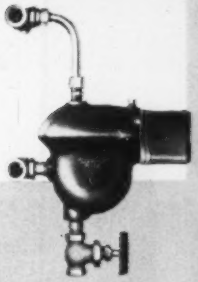
No. 76



The No. 76 is for boilers over 5,000 sq. ft. of radiation. It has the same design and operating principles of construction as Series 60 except with larger float and feed valve. Water connection ¾". For combined feeder and cut-off, specify, No. 76LWD.

LOW WATER CUT-OFF

No. 89A

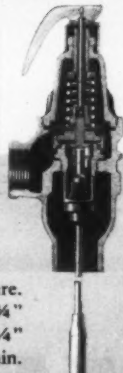


Features standard mercury switch and a surge-snubbing float chamber for positive switch service. For gauge glass installation on low pressure steam boilers.

Protective Devices for Hot Water Supply Systems

TEMPERATURE & PRESSURE RELIEF VALVES

No. 140 750,000 BTU
No. 240 1,125,000 BTU



Automatic self-closing T & P protection for industrial, institutional and commercial storage tank applications. Emergency steam pressure relief feature. No. 140, 1" male inlet, ¾" female drain. No. 240, 1¼" male inlet, ¾" female drain. Pres. range 75-150 lbs. Std. set 125 lbs. Temp. 210°.

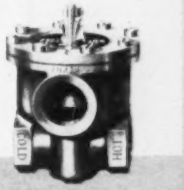
TEMPERATURE & PRESSURE RELIEF VALVE

No. 340

High capacity T & P protection for large hot water supply storage tanks with over 1,000,000 BTU input. Pilot operated. Discharge capacity up to 3,000,000 BTU/HR. All bronze body and trim, heat-resisting disc and diaphragm. 1½" or 2" male inlet connection. 1¼" female drain. Pressure range 75-150 lbs., standard setting 125 lbs. Temperature 210°.

HOT WATER TEMPERING VALVE

No. 71



For domestic hot water service to prevent scalding and conserve hot water. Automatically mixes cold water with hot water and delivers safely tempered water to outlets. High quality corrosion-proof bi-metal thermostat. Standard set 150°. Adjustable 100° to 180° female connections.
Sizes: ½", ¾", and 1".

We also make a complete line of water, steam, and air pressure reducing valves, vacuum breakers, and strainers.

Send for catalogs describing our complete line and for the new technical publication, Pamphlet No. 1, concerning the proper sizing of relief valves.

WATTS REGULATOR COMPANY - LAWRENCE, MASSACHUSETTS

REZNOR'S
new SECTIONAL
Duct Furnace

- **Capacities to over 2,000,000 BTU**
- **Sectionalized to simplify installation**

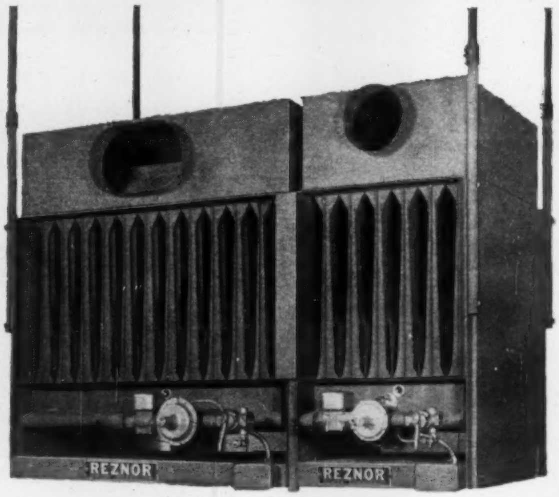
Now you can design the *ideal* system for every duct heating situation — and be sure of the equipment to make it work. Reznor's sectionalized assembly (a completely new concept in duct heating equipment) means that installation problems no longer keep you from planning capacities up into the millions.

To provide a system of maximum efficiency at lowest cost, install one of these new furnaces as the heat exchanger with components for air moving, cooling, cleaning and humidification chosen to meet the requirements of the specific application.

New Reznor series DS sectional duct furnaces are assembled on the job out of four basic sections: 150,000 - 200,000 - 250,000 - 300,000 BTU. Capacities range upward in steps of 50,000 BTU from 150,000 to several million BTU. And because the new units are designed to handle large volumes of air with minimum pressure loss, capacities in excess of 2,000,000 BTU are often completely practical.

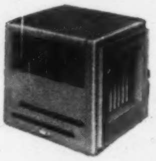
In addition to the revolutionary DS series, Reznor engineers have also perfected a completely new design for a series of small capacity duct furnaces. Though differing in construction from the DS series, the new series D models offer the same advantages of high efficiency, compact design and light weight. And they have the same adaptability to use in all custom engineered systems for comfort or process heating.

Suggestions on how to take advantage of Reznor's new concept — sectionalized assembly — plus complete details on construction and performance of the new units are included in two new bulletins. Because a Reznor duct furnace may be the key to the solution of any particularly difficult problem, you need to have these bulletins in your files. Use the coupon below to send for your free copies today.



SERIES DS — 150,000 to several million BTU

Each section is complete with controls and built-in draft diverter. Sections can be operated independently to meet less than peak load requirements. Burners are installed in a drawer which slides out the front of the unit to provide easy access for inspection and cleaning. All controls are attached to the burner drawer. Sections may be installed side-by-side in a single bank or back-to-back in a double bank. View above shows the 450,000 BTU model (one 150,000 BTU and one 300,000 BTU section assembled side-by-side).



SERIES D —
50,000 to 125,000 BTU

Reznor series "D" duct furnaces are designed primarily for residential and small commercial applications. Four sizes — 50, 75, 100 and 125,000 BTU. Handsome steel cabinets have burner access and controls completely enclosed on one side.

REZNOR MANUFACTURING COMPANY
51 Union Street, Mercer, Pa.

Please send me my free copies of Bulletins B-55-D and B-55-DS on your new duct furnaces.

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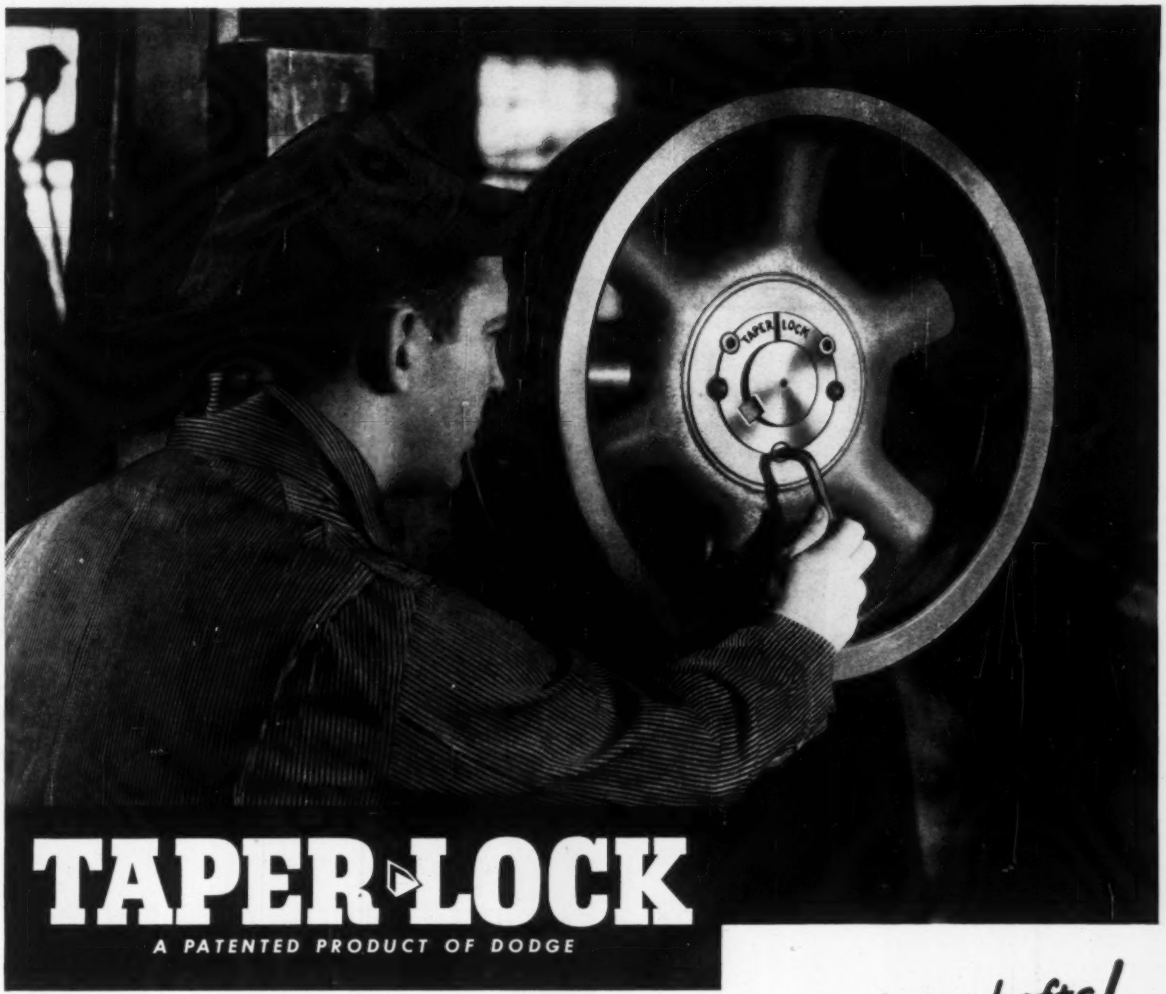
REZNOR
THE WORLD'S LARGEST-SELLING
GAS UNIT **HEATERS**



TAPER-LOCK

A PATENTED PRODUCT OF DODGE

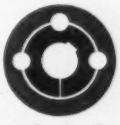
The simplest, surest means of mounting wheels to shafts!

Slip it on the shaft, line it up and tighten while sighting! Mount sheaves, sprockets, couplings, conveyor pulleys *quicker*—and more easily—with Taper-Lock bushings. A few twists of a hex wrench and Taper-Lock grips the shaft with the firmness of a shrunk-on fit. It comes off as easily, without shock to bearings or machinery. Bushing seats evenly along entire length of the hub—*wheels run true!*

Standardize on Taper-Lock. You save time and money and keep production rolling with these *interchangeable* bushings. See your Dodge Distributor, or write us for the full Taper-Lock story.

CALL THE TRANSMISSIONEER, your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified telephone directory, or write us.

THERE'S ONLY ONE TAPER-LOCK, THE BUSHING THAT MOUNTS FLUSH!



Standardize, economize with Taper-Lock, the bushing that is interchangeable in Dodge sheaves, sprockets, couplings and conveyor pulleys. *More than 2,000,000 in use!*

DODGE

of Mishawaka, Ind.

DODGE MANUFACTURING CORPORATION, 1600 UNION STREET, MISHAWAKA, INDIANA

Carrier water cooling

now come in

three new

for air conditioning or process

25-hp, 40-hp and 60-hp units now available. Three new sizes. They team up with Carrier's 75-hp, 100-hp, 125-hp and 150-hp units to give a complete line of packaged, thoroughly tested, water cooling systems!

Neat, rugged, compact units. Carrier water cooling systems come completely assembled except for motor. Components are mounted in heavy-duty supporting frame. Units are so compact, they fit through average-size doorway, take minimum of floor space.

Quickly and easily installed. With all but the motor included, there's nothing to assemble —and no delayed parts or components to hold up the job. Only simple connections for water and electric power lines are needed.

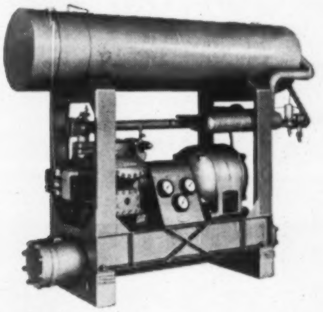
Everything from one manufacturer. Carrier stands behind every water cooling unit. No divided responsibility. Saves time and trouble all around. For complete details and specifications, call your local Carrier dealer or branch office. They're listed in your Classified Telephone Directory. Or write to Carrier Corporation, Syracuse, New York.

systems

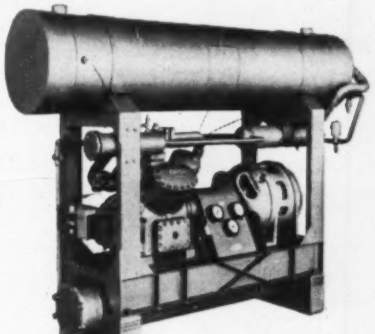
sizes

refrigeration

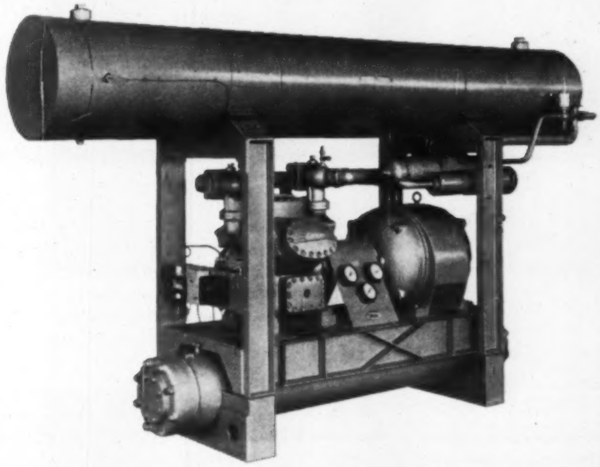
25 hp
Model 30D25



40 hp
Model 30D40



60 hp
Model 30D60



Carrier

air conditioning
refrigeration
industrial heating

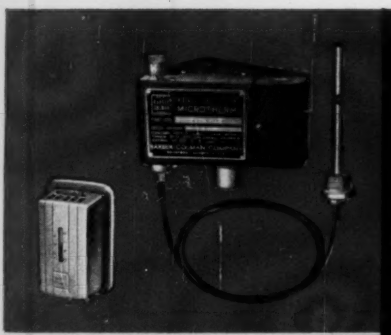
BARBER
COLMAN

ELECTRIC-
ELECTRONIC

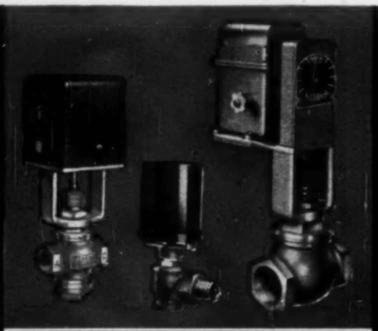
Automatic Controls

...**better** control ...electrically!

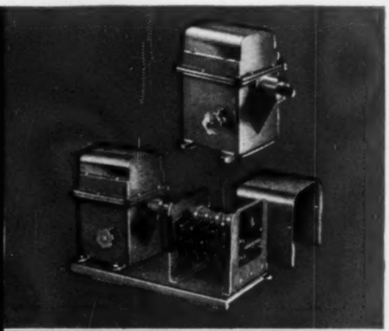
The swing is to electric and electronic controls for modern buildings ... and here's why! Remarkable sensitivity, plus the inherent positive positioning of proportioning controls, assure greater accuracy. Modern electric controls maintain temperature "right on the nose" night and day, for years on end. On zone jobs, outdoor sensing elements react to weather changes ... keep operating costs at a minimum. "Control Centers" slash costs of installation, checking, and servicing ... simplify layout of individual systems. Costs of long runs between systems are avoided, since power lines can be tapped practically anywhere. By installing wires in conduit, possibility of damage to control lines is eliminated, revisions can be made without tearing out walls, and quality of installation is above comparison. With the reliability of electrical devices proved in all aspects of our modern life ... and with ceaseless research marking important advances in electric controls ... no wonder the word is "*better* control ... electrically"!



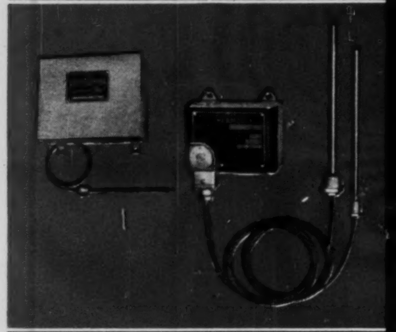
THERMOSTATS—single-and two-stage room and remote bulb thermostats for on-off control; room and remote bulb thermostats for proportioning control.



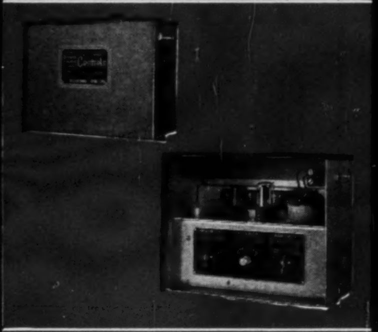
MOTOR-OPERATED VALVES—a complete line of factory-assembled, motor-operated valves for two-position and proportioning control. Wide range of sizes and types.



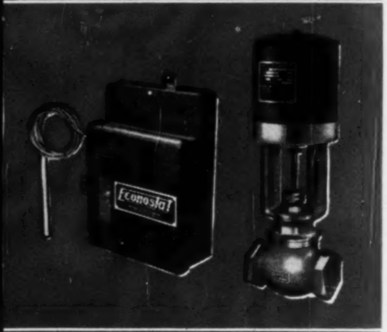
CONTROL MOTORS—spring return, unidirectional, reversible, multi-position, and proportioning types. Program switches for multiple step control of compressors, pumps, etc.



OUTDOOR RESET CONTROLS—both fixed and adjustable ratio outdoor reset hot water controls applicable to any size building, from a single office to a multi-story skyscraper.



ELECTRONIC CONTROLS—on-off or fully proportioning. Extremely sensitive and flexible control of air or liquid temperature. Large, legible, easily understood dials.



ECONOSTAT ZONE CONTROL—outdoor-indoor zone control for multi-occupancy buildings. Night depression with automatic morning warm-up. Optional week end cutout.

Control Centers
ZONE Control
Outdoor reset Hot Water Controls
Electronic Hot Water Controls
Electronic Humidity controls

WANT MORE INFORMATION? Up-to-the-minute literature, complete with all necessary design data, is available on all Barber-Colman Automatic Controls, as well as on modern types of control systems. Call nearby Field Office, or write us for data bulletins on *your* project.

Shown here are just a few types of modern electric and electronic controls available from Barber-Colman. Our company has a remarkable background in design, engineering, and production of fine equipment ... our field staff has no peer in solving application problems. Come to us for answers to any questions about temperature control ... you'll get "*better* control ... electrically"!

BARBER-COLMAN COMPANY

Dept. M, 1301 Rock Street, ROCKFORD, ILL., U.S.A. • Field offices in principal cities

Automatic Controls • Air Distribution Products • Industrial Instruments
Aircraft Controls • Small Motors • Overdoors and Operators • Molded
Products • Metal Cutting Tools • Machine Tools • Textile Machinery

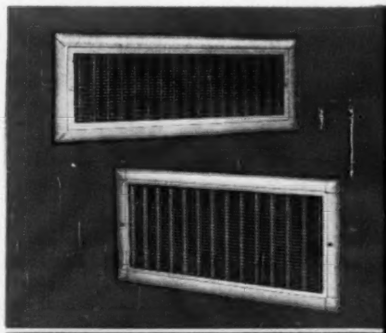
BARBER
COLMAN

*UNI-FLO
ENGINEERED*

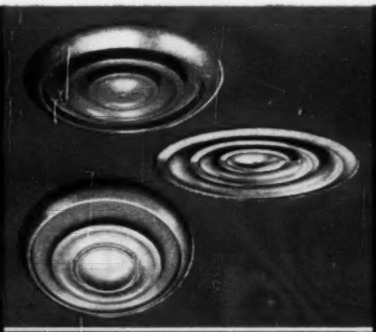
Air Distribution

...modern, versatile
...for better jobs

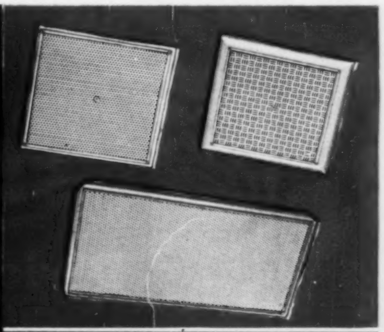
What happens when conditioned air enters a room marks the difference between success and failure of a complete job. If there are drafts, uneven distribution, or noisy operation at point of room entry, the entire system is condemned. On the other hand, if air is delivered efficiently, unobtrusively, quietly, the whole job is lauded. The one way to write an insurance policy on satisfaction with each job is to specify the finest available air distribution equipment. Then you know you will get the best possible results from the entire system, free from troublesome and costly service calls. At the same time, you assure yourself of proved designs which are easier to install, harmonize beautifully with modern surroundings, last a lifetime. In the Uni-Flo line you get all these advantages, plus many exclusive developments. Choose from this wide selection:



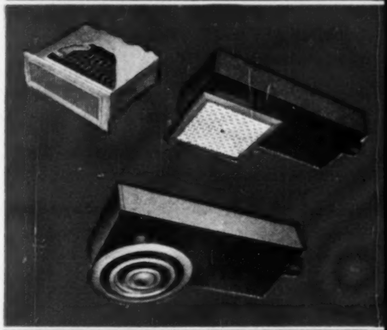
GRILLES, REGISTERS—available with a wide variety of frame styles and core designs to meet all wall and door installation requirements. Wide selection of finishes.



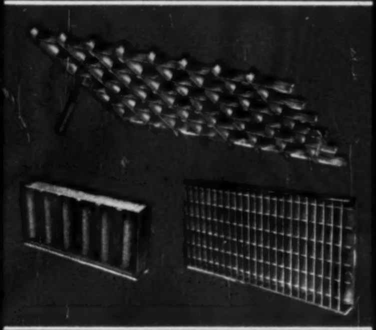
CEILING DIFFUSERS—Venturi-Flo units provide adjustable air patterns in a complete range of sizes. Minimize ceiling smudge. Available with integral lighting.



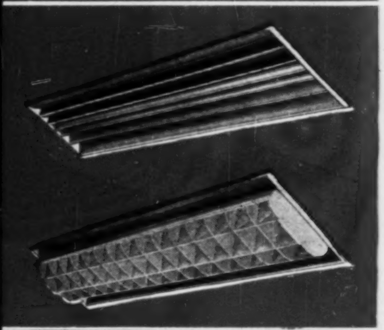
SQUARE, RECTANGULAR DIFFUSERS—to match acoustical ceiling designs. Adjustable air patterns . . . exclusive with Uni-Flo. Surface or recessed types. Minimize ceiling smudge.



HIGH VELOCITY UNITS—control units and air valves reduce high velocity, high pressure air to conventional flow. Available with sidewall or ceiling diffusers and to supply air to branch ducts.



UNI-FLO ACCESSORIES—unique Uni-Flo developments for more efficient handling of air in ducts, grilles, registers, diffusers. Assure even air distribution. easier system balance.



LINE-O-FLO CEILING DIFFUSERS—provide uniform air distribution over entire length of linear units. Supplied with or without integral fluorescent lighting fixtures.

BLAZING THE TRAIL *TO BETTER AIR DISTRIBUTION*

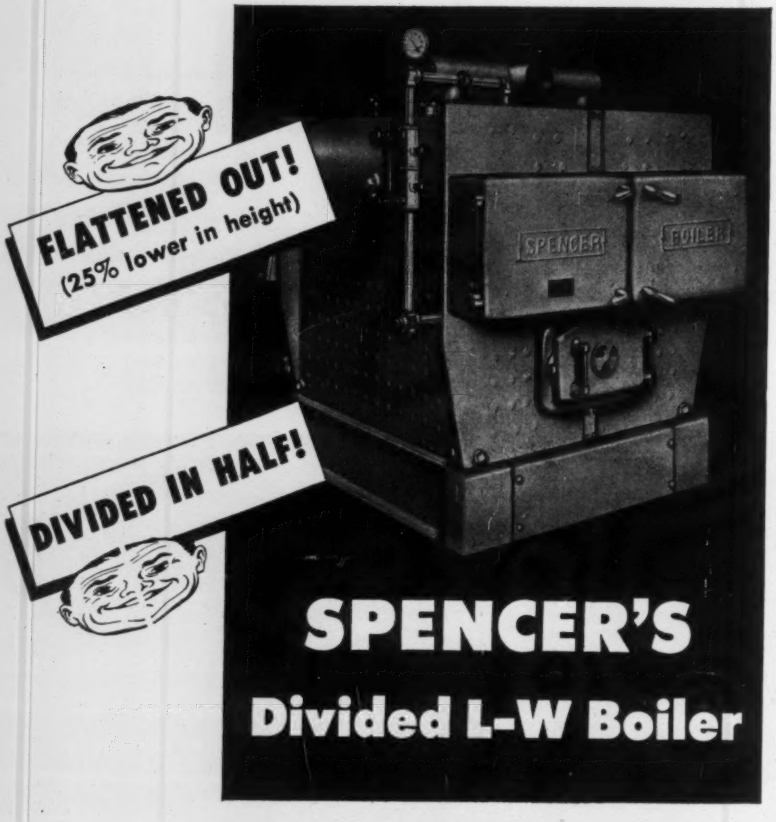
When Barber-Colman entered the air distribution field, almost twenty years ago, we found meager and incomplete selection data. Up to then, rule-of-thumb methods were in common use. "Guesstimating" was accepted practice in determining sizes and proportions of the opening; the grille in most cases was added merely for decorative purposes.

In our research laboratory, every possible condition of air distribution was simulated. Results were tabulated and compiled into usable application data bulletins. Today, this time-proved information is used by architects, engineers, and contractors to determine exact requirements for each application.

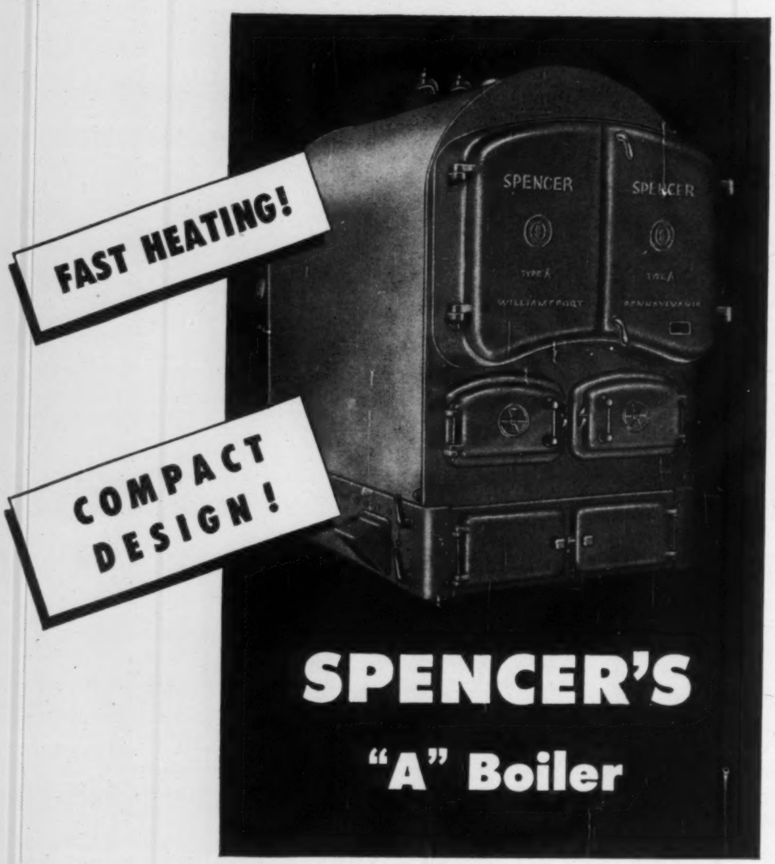
From our research laboratory, too, come such outstanding "firsts" as opposed-blade volume control and air flow balancing devices; air turning equipment; adjustable ceiling outlets; high velocity air valves . . . to mention only a few.

Today, Barber-Colman's certified data is available to you from our nearby Field Office. Phone or write us for information on any type of air distribution device, or for engineering help. Specify Barber-Colman and *be sure!*

BARBER-COLMAN COMPANY, Dept. M, 1301 Rock Street, ROCKFORD, ILLINOIS



SPENCER'S
Divided L-W Boiler



SPENCER'S
"A" Boiler

SOLVE
MAJOR HEATING PROBLEMS WITH ADVANCED SPENCER DESIGNS!

Unique Low-Waterline Boiler Solves Special Installation Problems

It's 25% lower than conventional boilers of the same capacity, solving low headroom problems in existing buildings . . . excavation problems in new buildings.

Divided in half, it can be moved—one watertight section at a time—through narrow doorways.

It features all the many design dividends that provide traditional Spencer top efficiency at low cost . . . can be adapted to any fuel . . . mechanical or hand firing.

Sizes ranging from 3,500 to 42,500 sq. ft., steam.

Durable Spencer "A" Series Cuts Installation Time . . . Provides Economical Heat

Unique flue-and-smokebox units save hours in installation time.

Compact design saves valuable floor space—takes less headroom.

Special peaked firebox and staggered boiler tubes provide faster heating . . . more efficient heat transfer.

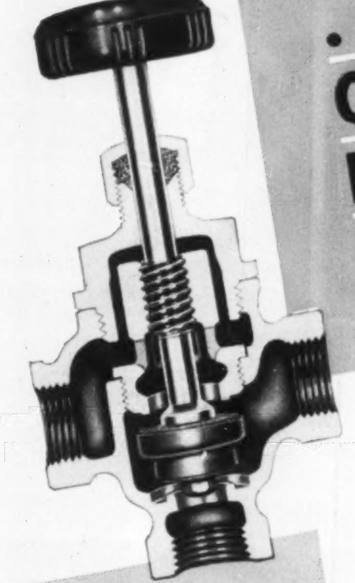
Available for stoker or hand firing . . . can be adapted to any fuel.

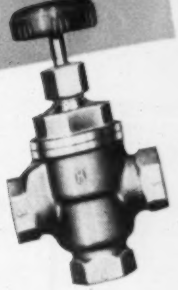
Sizes ranging from 3,500 to 42,500 sq. ft., steam.

SPENCER
HEATER
LYCOMING DIVISION
WILLIAMSPORT AVCO PENNSYLVANIA

For information and specifications on Spencer's commercial boilers, write to: Dept. HP 15, Spencer Heater, Lycoming Division, AVCO Manufacturing Corp., Williamsport, Pa.

. . . You Provide Separate Comfort Control for Every Room with this *NEW* O-B Three-Way Valve





The O-B No. 4600 valve is especially designed for forced circulation heating or cooling systems using remote units.

With its parallel double-seat construction, the No. 4600 can be used to control flow in three ways:

1 The entire water flow can pass through the unit.
2 Any predetermined portion can flow through the unit and the rest will be by-passed to return piping.
3 All the water can be made to bypass the unit.

The occupants of any room can thus control temperature to their liking without affecting the rest of the system in any way.

Regardless of the position of the valve, the total quantity of water pumped through the system does not change. This means a constant pump delivery so that the danger of overloading is practically eliminated.

No. 4600 valve is available in ⅜ and ½-inch sizes. Additional information on this new valve is contained in Bulletin 1319-V. For your free copy, mail the coupon below.

Check

THESE OUTSTANDING FEATURES

1 Individual control of room units.
2 Helps prevent overloading of pump motors.
3 Composition discs are renewable without removing the valve from the line.
4 Full flow, partial flow or complete by-passing of unit.
5 Maximum water working pressure 300 pounds and maximum operating temperature 425° F.

Ohio Brass

MANSFIELD OHIO, U.S.A.

CANADIAN OHIO BRASS CO., LTD., NIAGARA FALLS, ONT.

4464-V

Ohio Brass Company
380 N. Main Street
Mansfield, Ohio

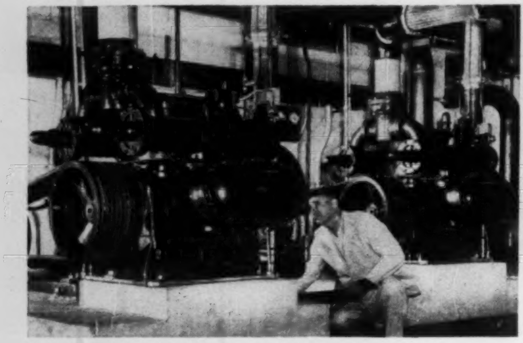
Please send me my copy of Bulletin 1319-V describing the new O-B Three-Way Valve.

Name ______________________

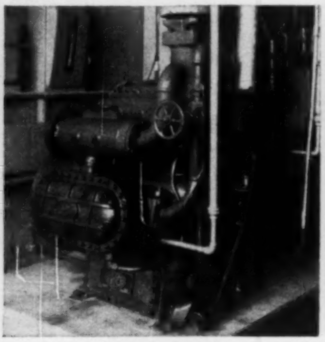
Company ______________________

Address ______________________

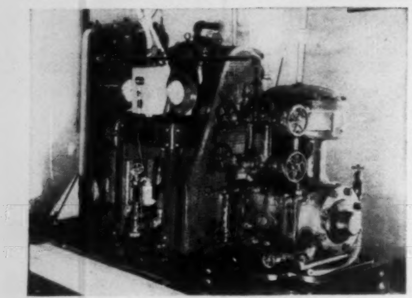
Frick "ECLIPSE" Type PF compressors, built in six sizes up to 150 H.P. and having 2, 3, 4, 6 or 9 cylinders, may be used with any refrigerant at any temperature. They are ideal for such work as air conditioning, marine service, watercooling, food storage and processing.



"ECLIPSE" Type AHP compressors are available for regular ammonia service under high operating pressures. These heavy-duty machines are built in three sizes with 3, 6, or 9 cylinders of 3½" bore and 4¼" stroke.

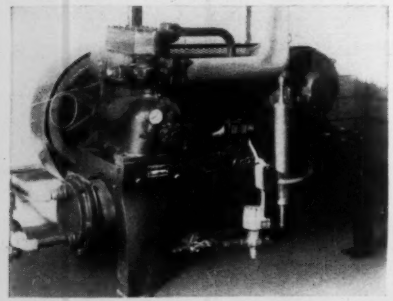


"ECLIPSE" Type PAB booster compressors, built in six sizes, are noted for their dependability and efficiency. Small frosted lines cool the cylinder valve plates with direct-expansion refrigerant—a patented Frick feature.



Combined ammonia units are manufactured in three sizes ranging from 2½ to 10 tons of refrigeration. They are a popular choice for food service, cooling drinking water, making ice, dairy plants, etc.

Frick low pressure units are built in 36 sizes from ¼ to 15 hp. Condensers on smallest machines are air cooled; on intermediate sizes, air or water cooled; and larger sizes, water cooled.



TRADE FRICK MARK COMPRESSORS

the Refrigeration Industry's Most Comprehensive Line

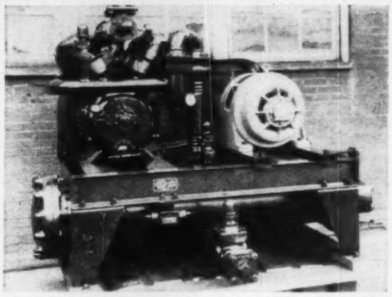
83 Types & Sizes

When you specify Frick machines you have the widest choice of models, and are sure of getting a compressor exactly suited to your needs.

Are you handling one of the Freons, or ammonia, or some other refrigerant? At what temperature? Whatever your load, there's a Frick machine built to meet every commercial and industrial requirement.

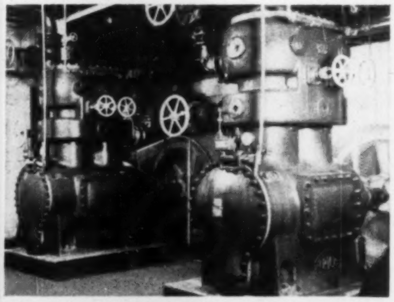
Tell us about your cooling work, and we'll send you the full facts and figures on Frick equipment to match the job. Branches and Distributors in principal cities, or write directly to

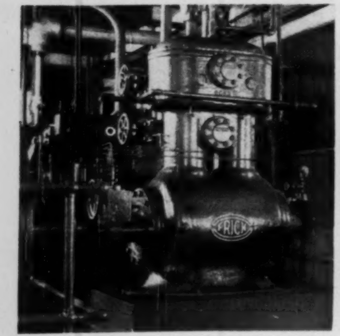
DEPENDABLE REFRIGERATION SINCE 1882
FRICK Co.
WAYNESBORO, PENNA. U.S.A.



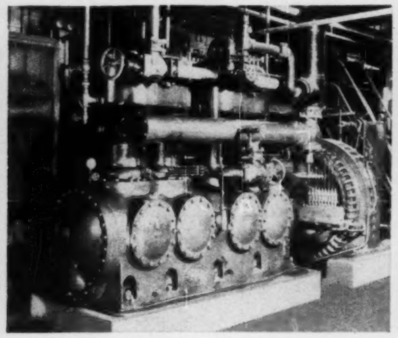
"ECLIPSE" Type PF low pressure units are furnished in 15, 20, 30, 40 and 60-hp sizes. Shell-and-tube coolers may be added to form compact water chilling units.

Frick Company pioneered the development of the booster compressor. Since 1929 these Type FB machines, built in seven sizes, have been regularly installed by ice cream and quick freezing plants all over the world.

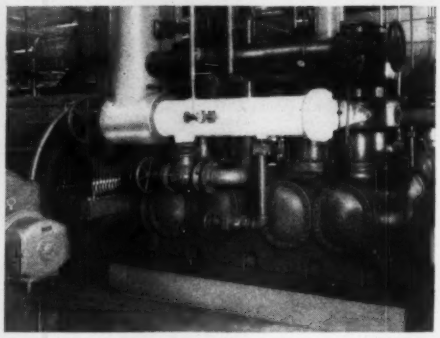




Frick two-cylinder enclosed Type V.S.A. ammonia compressors have been perfected over the past 40 years, until today they are the standard of the industry. They are available in capacities from 2 to 300 tons, in 11 sizes.



Four-cylinder Type V.S.A. enclosed compressors are normally offered in four sizes with capacities up to 800 tons. Furnished with capacity controls on each cylinder, these machines give the user maximum flexibility and durability on heavy-duty refrigerating service, such as in the food and chemical industries.



Frick four-cylinder Type FB enclosed V.S.A. ammonia booster and Freon-12 compressors are available in 15" by 10" and 17¾" by 12" sizes. Seabrook Farms, the world's largest quick-freezing plant, has eight of the larger size.

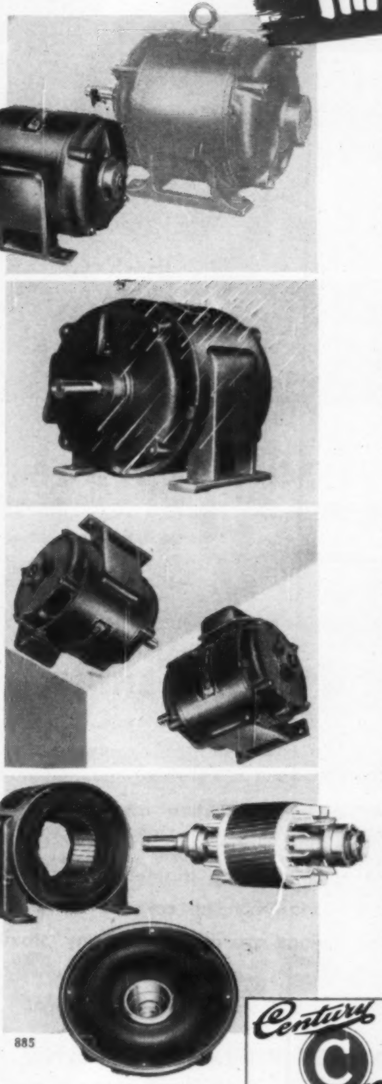
NEW *Century*

Performance-Rated©

INTEGRAL H.P. MOTORS

Now available in
1 . . . 1½ . . . 2 H.P. sizes—
NEMA frames 182 and 184.

Improved Motors to match your needs



SMALLER — LIGHTER

More uniform silicon-laminated steel; thinner, *tougher* "Mylar" slot insulation — just two of the many technical developments that help make these new Century Performance Rated Motors so much *smaller* and *lighter*.

BETTER PROTECTION

New concepts of internal motor ventilation permit end bracket and frame design that gives far better protection from falling liquids and solids . . . still maintain 40°C. temperature rise.

MORE FLEXIBLE MOUNTING

You can even have cushion mounting with these new Century Integral H.P. Motors — your choice of sleeve or ball bearings. Ball bearing motors mount vertically, upside down, in any position. End brackets can be rotated for floor, ceiling or side wall mounting.

EVEN MORE DEPENDABILITY

Improved plastic impregnating varnish and plastic insulated magnet wire provide unusual resistance to abrasion, moisture and heat. These new materials possess far better dielectric qualities. Die cast aluminum rotors are individually, dynamically balanced to assure freedom from vibration.

Specify CENTURY Performance Rated motors for your equipment. Call a Century District Sales Office or your nearest Century Authorized Distributor.

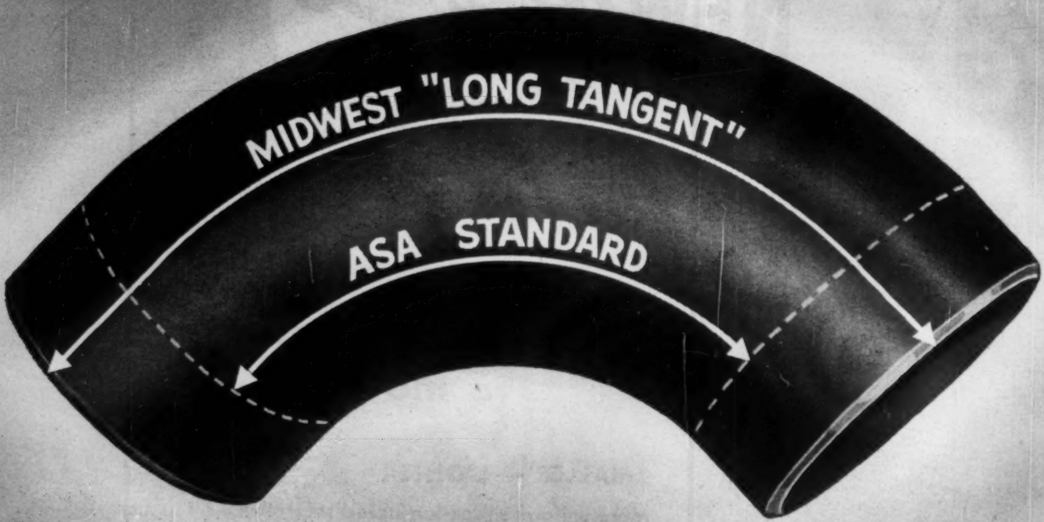
VISIT CENTURY'S BOOTH NO. 900, INTERNATIONAL HEATING AND VENTILATING SHOW — PHILADELPHIA, Jan. 24-28

Century C MOTORS

Offices and Stock Points in Principal Cities

CENTURY ELECTRIC COMPANY • 1806 Pine Street • St. Louis 3, Missouri

When you buy welding elbows . . .



Why take less when you can get more?

. . . (and at the same price)

ADVANTAGES OF MIDWEST "LONG TANGENT" ELBOWS

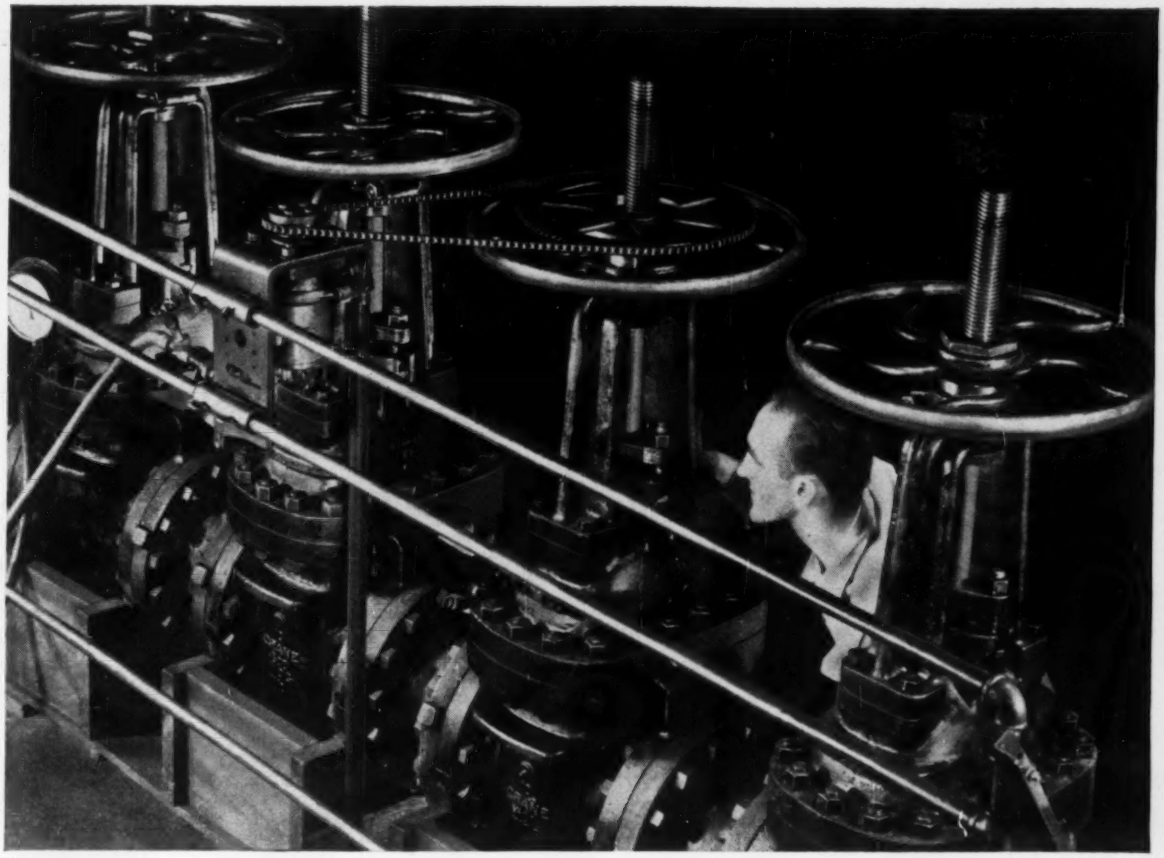
- ★ They save pipe.
- ★ They often eliminate short nipples and their extra welds.
- ★ They save time and money in lining up and clamping pipe and fitting.
- ★ They make it easier to apply slip-on flanges.
- ★ They remove the circumferential weld from point of maximum stress and can be sleeved.
- ★ THEY COST NO MORE THAN OTHER ELBOWS.

As shown in the illustration above, Midwest "Long Tangent" welding Elbows have straight ends equal to ¼ of the nominal fitting diameter (a 12″ elbow has tangents 3″ long). For the reasons listed at the left, substantial savings are made on many piping systems by using Midwest "Long Tangent" Elbows. For more information about them, write for Catalog 54.

MIDWEST PIPING COMPANY, INC.
Main Office: 1450 South Second Street, St. Louis 4, Mo.
Plants: St. Louis, Passaic, Los Angeles and Boston
Sales Offices:
New York 7—50 Church St. • Chicago 3—79 West Monroe St.
Los Angeles 33—520 Anderson St. • Houston 2—1213 Capitol Ave.
Tulsa 3—224 Wright Bldg. • Boston 27—426 First St.
Cleveland 14 — 616 St. Clair Ave.
STOCKING DISTRIBUTORS IN PRINCIPAL CITIES

6722

MIDWEST WELDING FITTINGS IMPROVE PIPING DESIGN AND REDUCE COSTS



Testing...testing...50 years and longer to make CRANE VALVES maintenance free

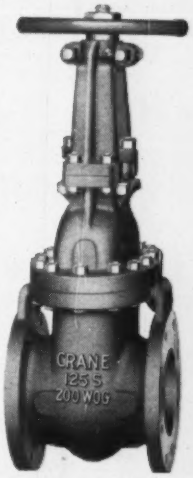
Testing for product performance values is an old custom with Crane. It was started long before many standards existed—long before others in the field used this means of product improvement and quality control.

Today's Crane valve testing is done in both field and laboratory by the most scientific techniques. This continuing work seeks to increase valve performance and lessen maintenance needs. A single example is the stem packing test shown above.

Here's one of the reasons back of the thrifty buyers' preference for Crane valves. They can rely on ever-improving Crane quality to protect their company's investments in piping equipment—especially today, in the face of high maintenance and repair costs. No wonder industry keeps using more Crane valves than any other make.

Better Quality
Bigger Selection
in Valves
for Every Need

for
the
THRIFTY
BUYER

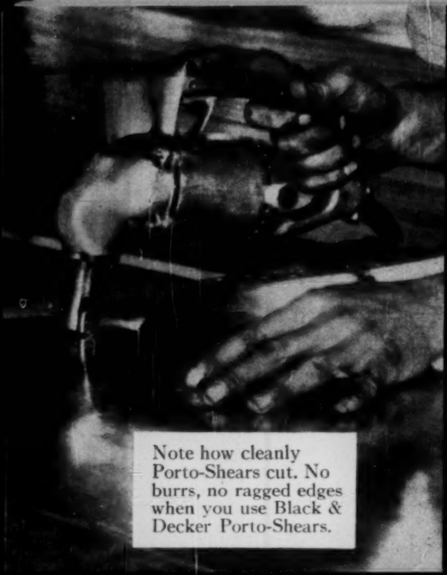


CRANE CO.

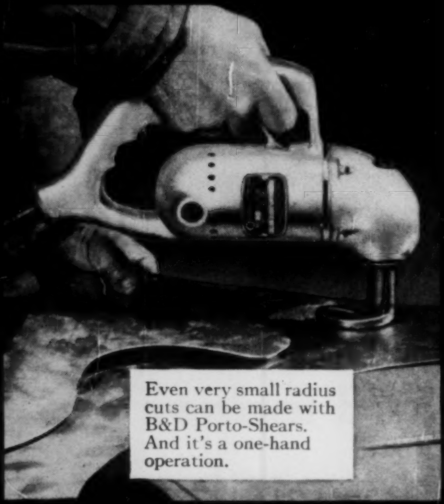
General Offices: 836 S. Michigan Ave., Chicago 5, Illinois
Branches and Wholesalers Serving All Industrial Areas

VALVES • FITTINGS • PIPE • PLUMBING • HEATING

CRANE'S FIRST CENTURY . . . 1855-1955

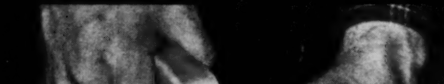


Note how cleanly Porto-Shears cut. No burrs, no ragged edges when you use Black & Decker Porto-Shears.



Even very small radius cuts can be made with B&D Porto-Shears. And it's a one-hand operation.

Note how easy it is to cut to exacting patterns with Porto-Shears*. Two models for 16 and 12 gage materials.
$95.00 and $145.00.



Black & Decker Porto-Shears cut many materials . . . stainless steels, Monel, copper, lead, etc. . . . in a wide variety of forms.

Zip, don't snip! Make short work of your shearing problems!

Cut all sheet metals; steel, stainless, Monel, copper, aluminum, lead, even plastics, rapidly, accurately with Black & Decker Porto-Shears. Feeds easily with only light cutting pressure. Patented shoe permits small radius cutting. You can cut to intricate patterns, thanks to constant blade visibility. B&D universal motor built just for this tool. Alternating and Direct Current. Full ball-bearing equipped. (Phosphor-bronze block eccentric.) 16 and 12 gage models . . . $95.00 and $145.00. See your Black & Decker distributor for demonstration, or write: THE BLACK & DECKER MFG. Co., Dept. 2801, Towson 4, Maryland.

CLASSIFIED TELEPHONE DIRECTORY TELLS WHERE TO BUY IT

For nearest distributor, see "Tools-Electric."

LEADING DISTRIBUTORS EVERYWHERE SELL

B&D Black & Decker

PORTABLE ELECTRIC TOOLS

* Trade Mark Reg. U. S. Pat. Off.

sell

DETROIT V·579

the silent gas valve!

UNIVERSALLY ADAPTABLE TO ALL TYPES OF GASES... ALL TYPES OF DOMESTIC GAS HEATING UNITS!

Silence can be golden in terms of profits when it comes to gas valves, too. That's because of the trend in modern residential construction to the single-story, basementless house which puts the heating-plant installation right next to living area. Here is where the Detroit V-579 Gas Valve really pays off. Its strong "Bi-flex" motor provides unfaltering opening and tight shut-off closing in absolute silence. Thousands of installations have proved its unsurpassed trouble-free performance. Simple in design, positive in operation, the V-579 operates independently of gas pressure and is available in sizes to fit any domestic heating system. Write today for Bulletin No. 229.

Check These Features

- **Silent operation—no click, no hum**
- **Rugged, compact—easy to service**
- **Inexpensive**
- **For all gases in all localities**
- **"Bi-flex" motor operated—low voltage**
- **Compensated for changes in ambient temperature**
- **Snap-acting opening and positive closing**
- **½-inch to 1¼-inch sizes**

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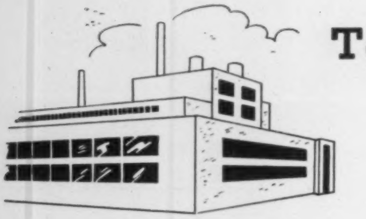

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Airtherm
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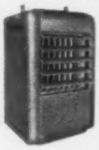
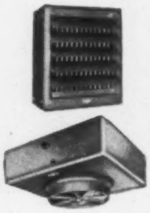


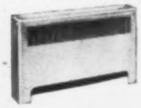
GAS FIRED UNIT HEATERS

Efficient answer to heating needs in all kinds of commercial, industrial and public buildings where there is no steam supply. Compact, suspended, propellor fan units available from 25,000 BTU to 200,000 BTU. Write for more information.



STEAM UNIT HEATERS
Horizontal and Vertical Discharge

Flexible heating to fit a wide range of requirements in offices, factories, warehouses, stores and public buildings. Horizontal Units available from 18,600 BTU to 270,000 BTU. Vertical Units available from 32,300 BTU to 350,000 BTU. Write for Catalog 1209.

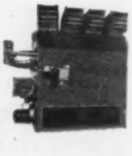


CONVECTORS

Outstanding for easy installation and long, trouble-free service. Clean, uncluttered design blends perfectly into both modern and traditional interiors. Available in a wide range of styles and sizes. Write for Catalog 702-A.

CENTRIFUGAL FAN UNIT HEATERS

Dual Purpose installation for both heating and ventilating can be easily made with this attractively designed unit. Specially desirable for industrial and commercial buildings, schools and auditoriums. Capacities up to 1,440,000 BTU. Available with dampers, filters and non-freeze coils.
Write for Catalog 403.



DIRECT FIRED SPACE HEATERS

Self-Contained unit for direct firing with gas or oil or combination gas and oil with instantaneous change over. May be used as both heater and ventilator or heater alone. Comes equipped with motor, burner, heavy-duty combustion chamber, plus all safety devices. Capacities from 650,000 to 2,000,000 BTU. Write for Catalog 802-B.

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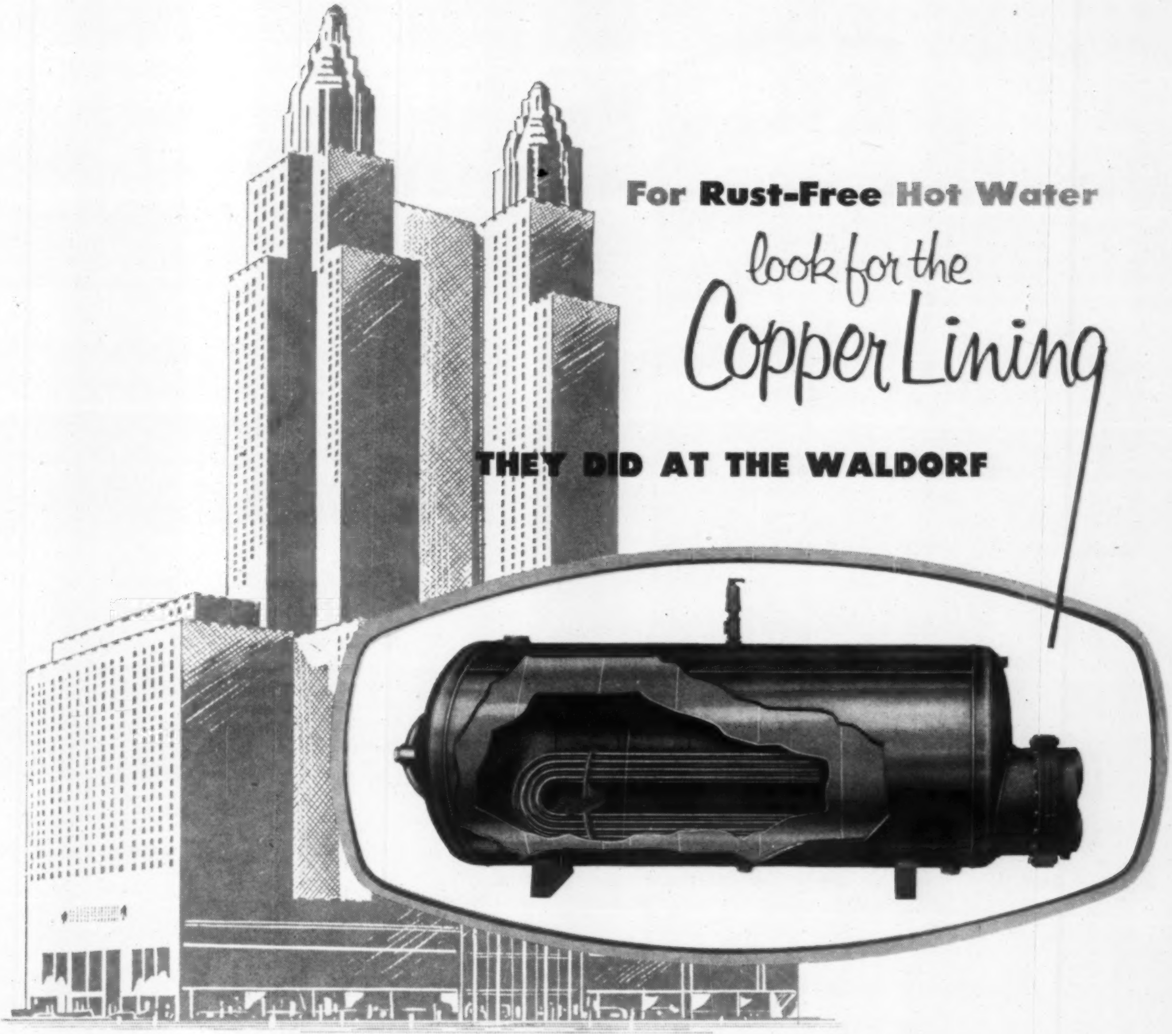
AIRTHERM MANUFACTURING COMPANY
711 South Spring Avenue • St. Louis 10, Missouri



The world-renowned Waldorf Astoria Hotel in New York is like a host of other important buildings in one respect: It depends upon p-k copper-lined water heaters for an unfailing supply of clean hot water.

The Waldorf is a city within a city—10,000 people filling 2,200 guest rooms and public halls. Always instantly on tap is an abundant supply of rust-free hot water from **p-k** copper-lined storage heaters.

A **p-k** copper-lined heater is a complete copper heater inside of a sturdy steel shell. It combines the non-corrosive qualities of copper with the great strength of steel.

If you're interested in *true* economy, **p-k** copper-lined are your logical choice. They outlast ordinary heaters. They assure enduring trouble-free operation. They require only routine maintenance.

For trouble-free, rust-free hot water—year after year—

LOOK FOR THE **p-k** Copper Lining

Comprehensive catalog gives you all the facts. It's yours for the asking.

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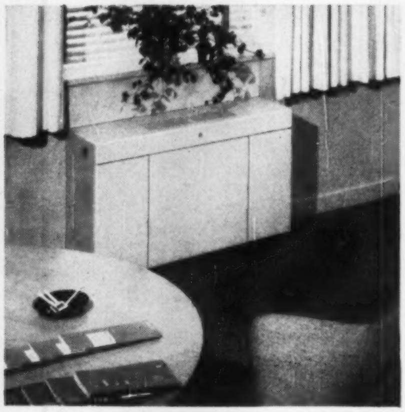
101 Park Avenue, New York 17 • Railway Exchange Building, Chicago 4 • 1700 Walnut Street, Philadelphia 3 • 96-A Huntington Avenue, Boston 16 • and other principal cities.



The Carnegie Endowment International Center

United Nations Plaza, New York. **Architects:** Harrison & Abramovitz; **Mechanical Engineers:** Syska & Hennessy; **General Contractors:** Caldwell-Wingate Co.; **Heating & Air Conditioning Contractors:** J. L. Murphy, Inc.

How to air condition an 11-story building *that's only 10 stories tall*

THERE is a trend toward lower ceiling heights, to reduce building costs and make rooms look "friendlier." Following this movement, the Carnegie Endowment International Center has low 9-foot ceilings. As a result the 11-story building was fitted in a normal 10-story building shell.

Low ceilings, however, create air conditioning problems. They cannot be furred down to hide the ductwork necessary for most air conditioning systems. *But, the American-Standard Remotaire system does not require bulky ducts.* One pipe carries chilled or hot water from a centrally located plant to each individually controlled Remotaire unit in the building.

Remotaire units condition the air through 4-row coils, and circulate it through the room. They filter and blend room air and fresh air.

Remotaire units come in 200, 400 and 600 cfm capacities. They can be recessed in the wall, either completely or partially, or left free-standing. Handsome steel jackets can be painted if desired.

Installation and maintenance of Remotaire units is easy. Plenty of wrench space is provided to make pipe connections. Motor and fan assemblies can be removed as a unit. Coils can be reversed for left or right-hand connection.

For more information about Remotaire send for descriptive literature . . . Form 417. **American Radiator & Standard Sanitary Corp.,** Dept. HP-84, Pittsburgh 30, Pa.

American-Standard Products

AMERICAN-Standard
WATER HEATING-COOLING SYSTEMS

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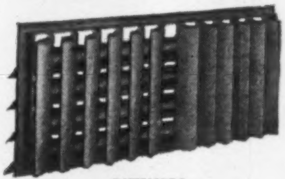
Available in Wide Range of Sizes, Patterns, Finishes and Metals



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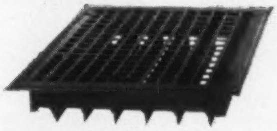
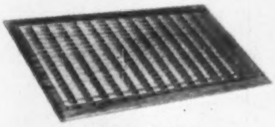
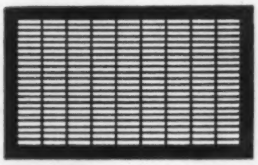
Double or Single



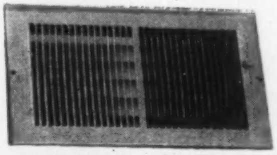
WALL REGISTERS
Available with Lock



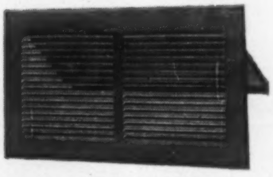
FLOOR GRILLES
Close Mesh



ARCHITECTURAL GRILLES



Multiple Valve REGISTER



Single Valve REGISTER

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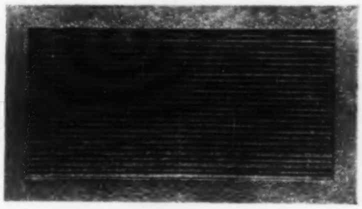
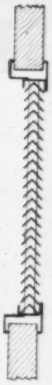
THIN CORE GRILLES

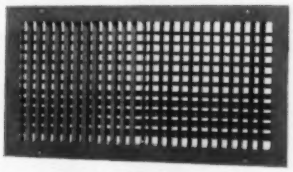


For Doors & Partitions 1/4" to 3 3/4" Thick!

- **Cuts Installation Time Over 1/2!**
- **Easy to Install — Anyone Can Do It!**
- **Complete — No Wood Moldings to Add!**



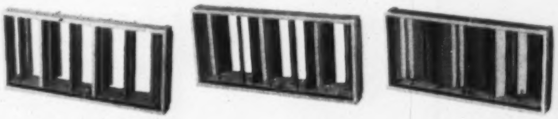
Telescoping auxiliary frame fastens to grille with posts and screws. Clamps tight. No holes to position. Practically ends danger of ruining door. All steel. No vision — 80% free area. All sizes — frame optional. Choice of finishes.



Detachable volume control meters air flow accurately from a "whisper" to a "full blast"! No "dead spots". Louvers move simultaneously in opposing directions. Gear-driven action. System may be balanced without removing outer grille.

GRILLE with Detachable VOLUME CONTROL

Features never before available. Increased directional control plus tamper-proof regulator. Individually adjustable vanes of extruded aluminum operate under spring-loaded tension. Eliminates possibility of tampering or accidental change in deflection pattern. Fully enclosed, wrap-around frame eliminates "air leaks". Available with or without volume control in any size. Choice of vertical or horizontal louvers only or combination of both with either louver in front.



Grilles for PERIMETER HEATING

Designed for floor use, or in walls with high velocity system. Heavy gauge curved vanes factory-set for fan-shaped air pattern. Single adjustable valve in 2¼" width, adjustable multiple valves in 4" and 6" widths. Available in 10", 12", 14" lengths; oak finish or prime coat.

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Fact:

NEW "Package" Precipitron Features Movable Nozzle Washing and Adhesive Application

2,000 to 10,640 CFM—12 SIZES—ONLY 38 INCHES LONG

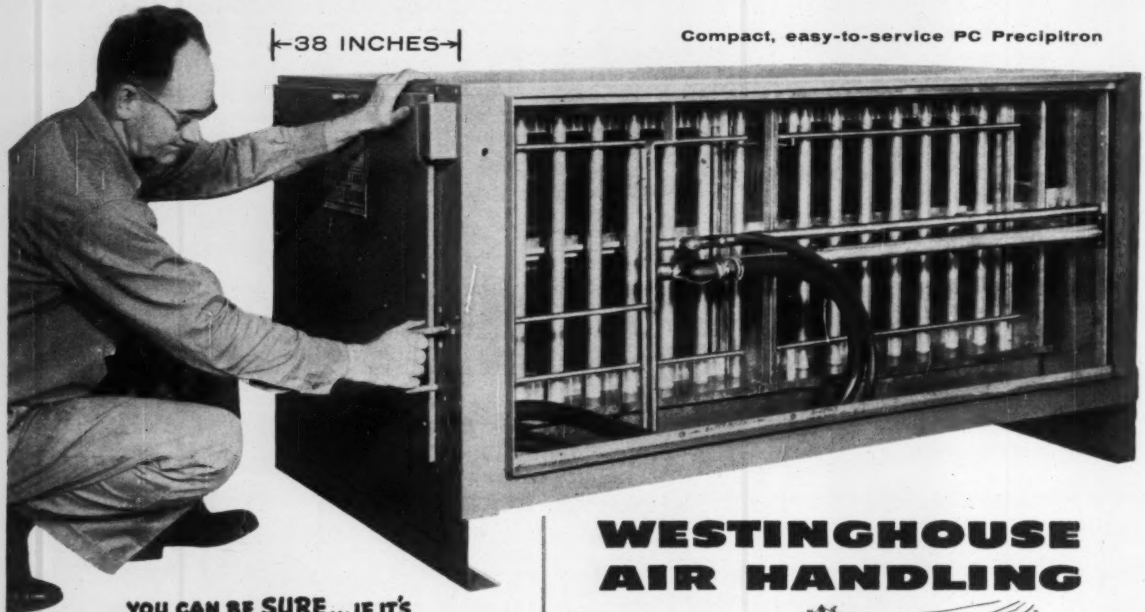
Another "First" from the Sturtevant Division of Westinghouse—the Type PC Precipitron—it's the "packaged" unit you have been looking for. An outstanding addition to the most complete line of air handling and air cleaning apparatus.

This remarkable unit features movable nozzle washing—the only successful and practical method of mechanical washing — and power adhesive spraying with movable nozzles. This eliminates need to open the unit or apply adhesive by hand. It may be mounted on floor, platform or ceiling, has built-in drain pan facilities, after filters and complete enclosure, including duct flanges.

Service is easy. The PC Precipitron has either right or left hand access through the side panel.

This compact PC Precipitron is ideal for use with air handling or air conditioning units, particularly in hospitals, retail stores, libraries and office areas. Equally applicable to industrial process requirements.

See this amazing unit at the A.S.H. & V.E. Show in Philadelphia. Or, call your Westinghouse-Sturtevant Sales Engineer . . . he is the "Man With The Facts" on air handling and electronic air cleaning.



Compact, easy-to-service PC Precipitron

WESTINGHOUSE AIR HANDLING

YOU CAN BE SURE...IF IT'S
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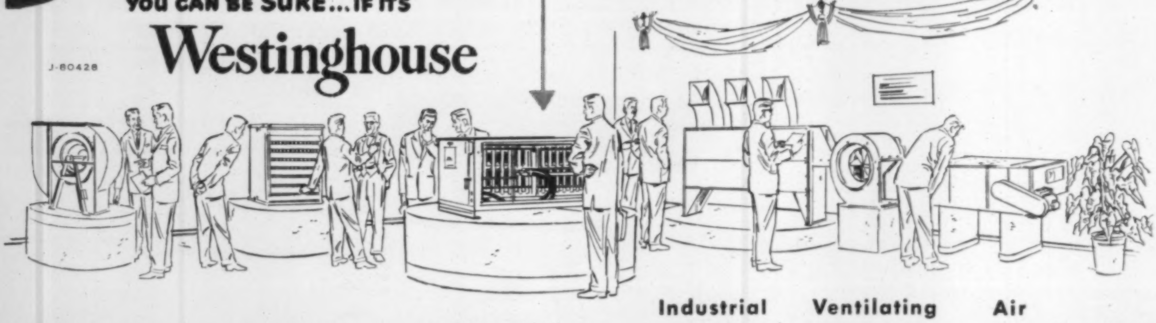
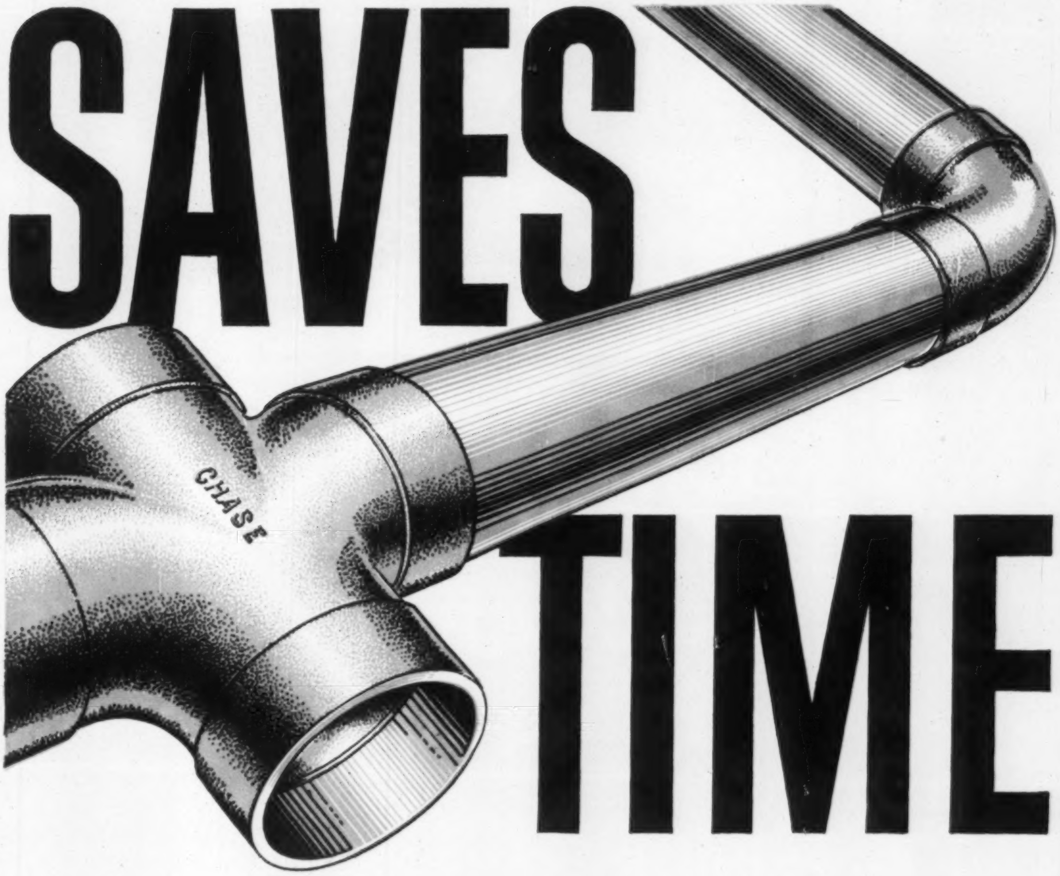
J-60428



SEE IT AT THE A.S.H. & V.E. SHOW! January 24 thru 28, 1955 Here's where you'll find the new PC Precipitron, with its exclusive features. Booths 540-544.

SAVES TIME!



Chase® Copper Tube for Soil, Waste and Vent Lines

means a neater, faster installation!

Save time on drainage installation—and final pressure-testing, too—with Chase Copper Tube and Solder-Joint Fittings.

Chase Copper Tube comes in long twenty-foot lengths, requires fewer joints, is light and easy to handle. What's more, it lets you pre-assemble entire sections... another timesaver!

Chase Solder-Joint Fittings do away with pipe-threading, eliminate the need for heavy, clumsy tools. With Chase Solder-Joint Fittings, it's *easy* to make a drainage system pressure tight *for good*, using standard soldering techniques.

Your nearest Chase Wholesaler has a complete stock of Chase Copper Tube and Solder-Joint Fittings. Call him before your next job!

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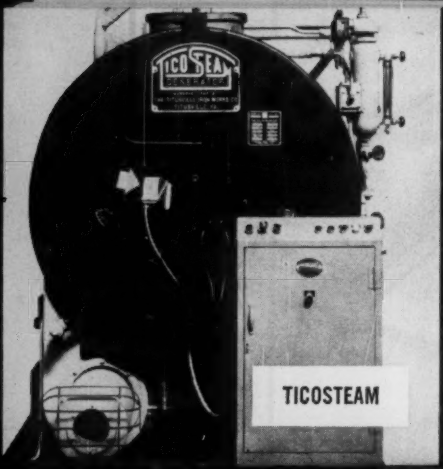

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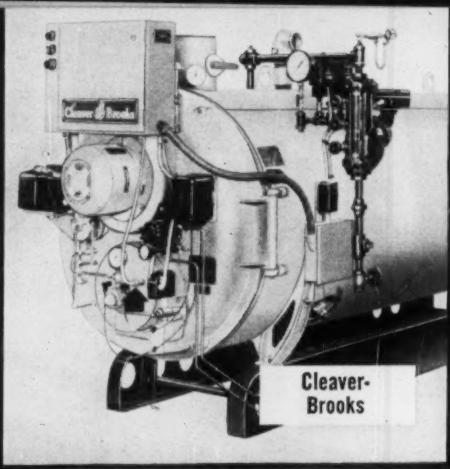
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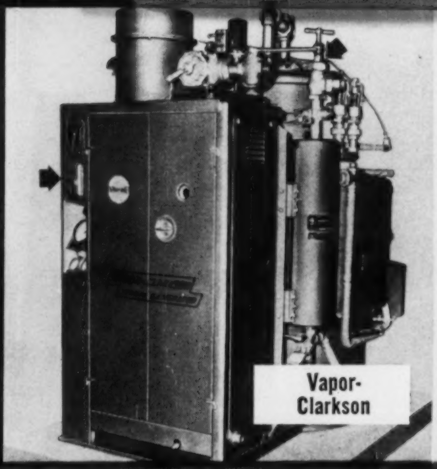
Cleaver-Brooks



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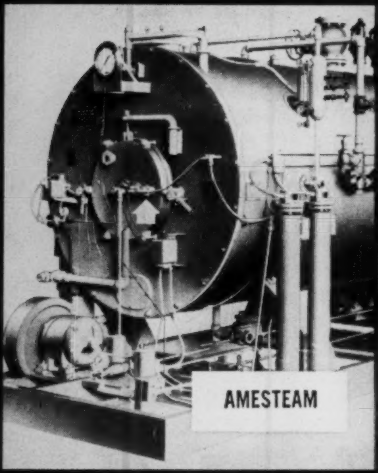

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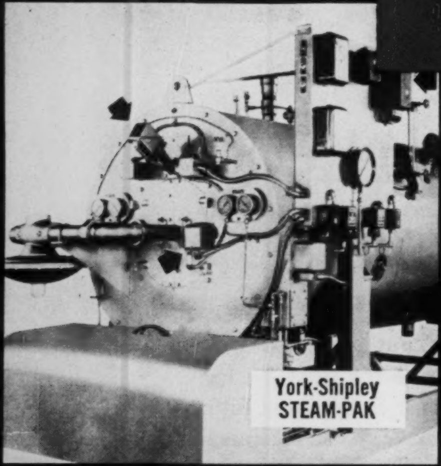

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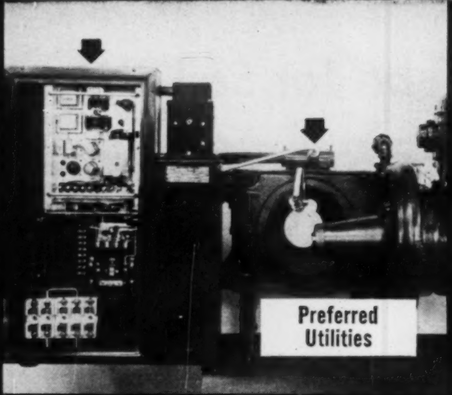

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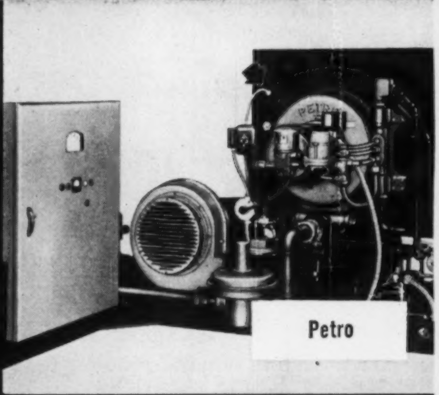

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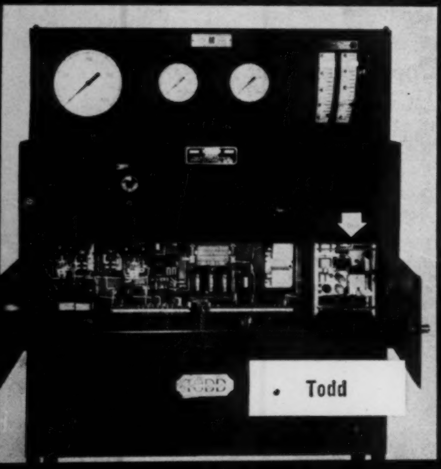

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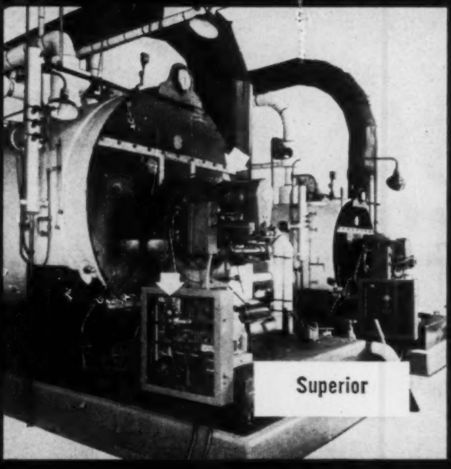

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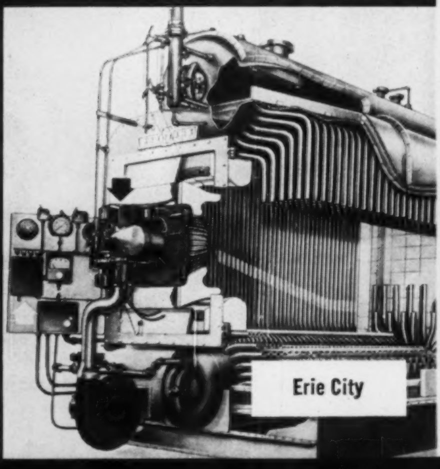
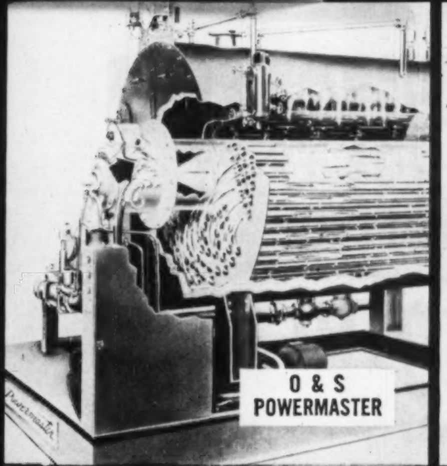


Erie City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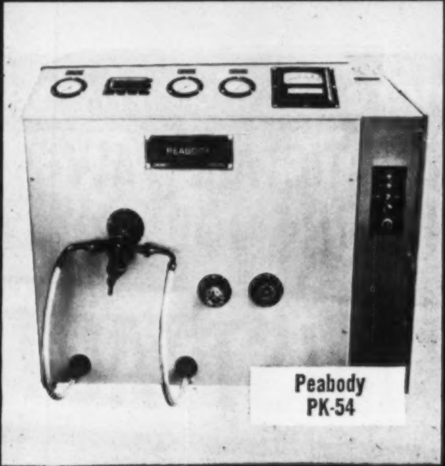
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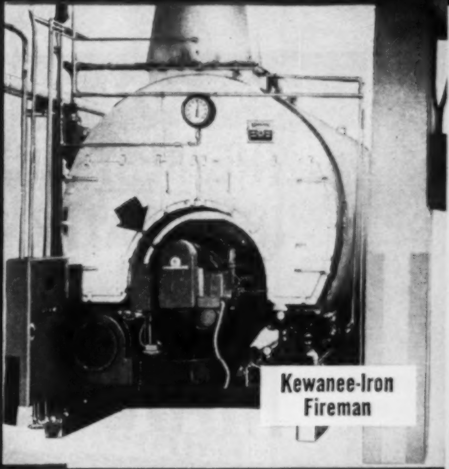
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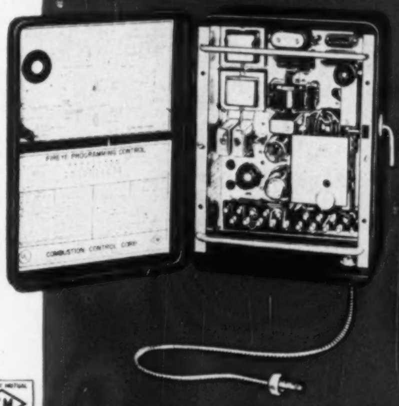
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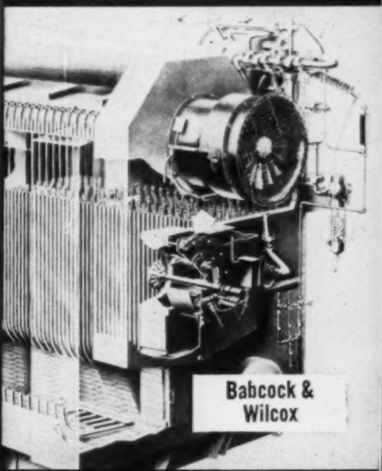
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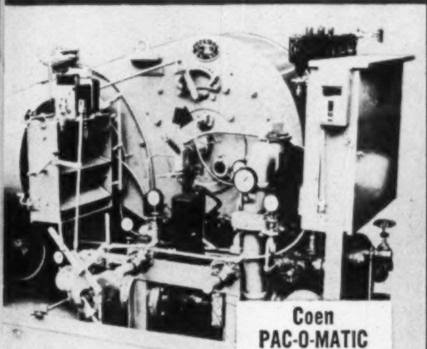
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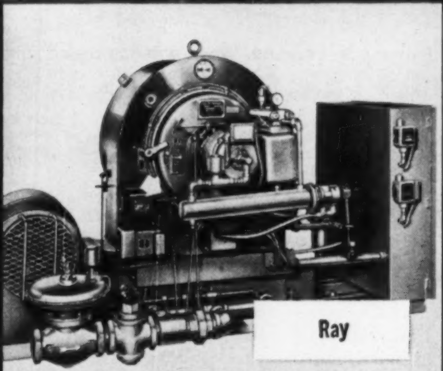
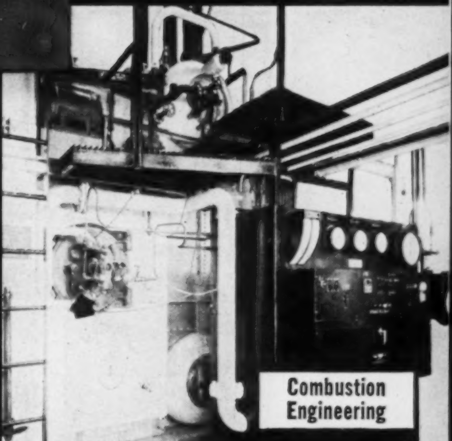

Ray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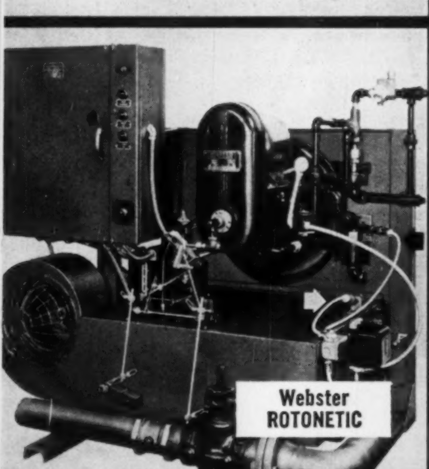
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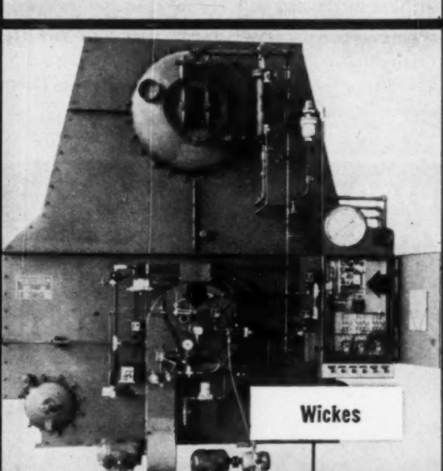
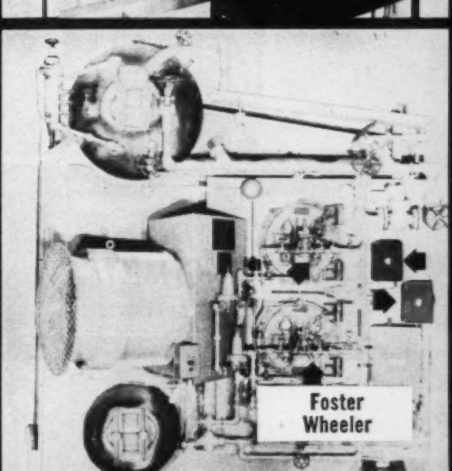

Wickes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continuous
venting
of hot water
heating
systems

install on
mains, pipe lines,
unit heaters,
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Get that air OUT...
and keep it OUT!

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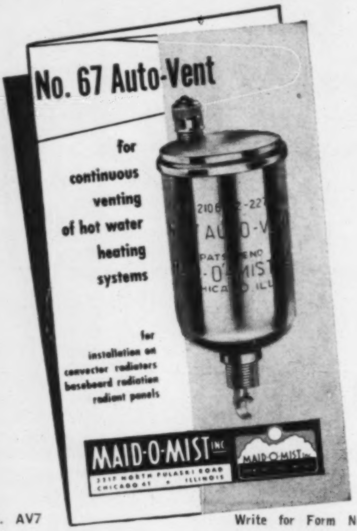

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continuous
venting
of hot water
heating
systems

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FOR HOT WATER
HEATING SYSTEMS

Install on
Convector Radiators
Baseboard Radiation
Free Standing Radiators

MAID-O-MIST INC
3217 NORTH PULASKI ROAD
CHICAGO 41 • ILLINOIS

Write for Form No. 72

The Envelope Stuffers illustrated above are designed for your use. When ordering copies, give Form No. as listed under each folder.

MAID-O'-MIST ADAPTER UNITS CONVERT STANDARD TEES INTO BALANCING VALVES

BALANCING VALVE
ADAPTER UNITS

FOR USE ON HOT W

NO. 15

NO. 14

MAID-O-MIST INC

Write for Form No. 1415

Maid-O'-Mist offers you a low cost unit for making up your own balancing valves. They are designed for the job of balancing rot water heating systems . . . easy to install . . . and priced much lower than square head cocks or other types of shut-off valves. These Adapter Units are quickly soldered or sweat fitted into regular copper or bronze tees, or threaded into cast iron tees. Inserted in side outlet of tee of the same pipe size to complete an efficient Balancing Valve for all types of forced circulation and hot water systems. Simple balancing adjustment requires only a screwdriver. Precision made of brass and monel metals with packed stem construction.

FULL FREE FLOW OF WATER THROUGH THE TEE. Since there is no inside reduction of pipe diameter, there is no water restriction except for the balancing required. This advantage plus low cost permits the use of additional balancing in a hot water system without preliminary planning.

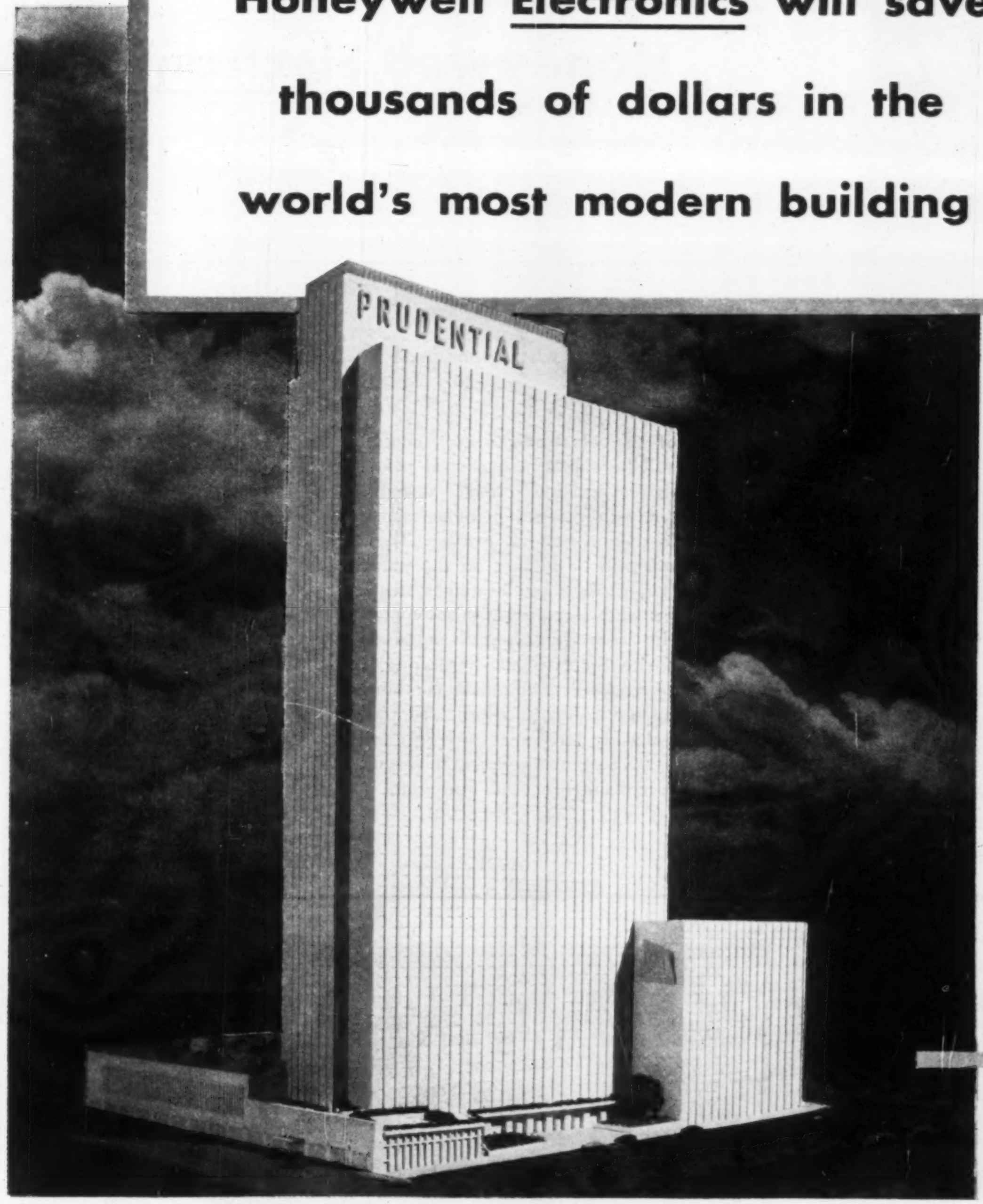
MAID-O-MIST Inc.
HEATING SPECIALTIES

AUTOMATIC HUMIDIFIERS . . . . . AUTO-VENTS
WATER LINE CONTROLS . HEATING SPECIALTIES

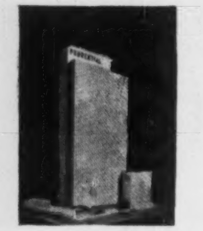
MAID-O'-MIST, Inc.

3217 NORTH PULASKI ROAD . CHICAGO 41, ILL.

Honeywell *Electronics* will save thousands of dollars in the world's most modern building



Model of the Mid-America Home Office of The Prudential Insurance Company now under construction in Chicago. Architects and Engineers: Naess & Murphy, Chicago. General Contractor: George A. Fuller Co.; Air Conditioning and Refrigeration Contractor: William A. Pope Co.; Heating Contractor: H. P. Reger & Co.; Ventilating Contractors: R. B. Hayward Co. and Jamar-Olmen Co.; Electrical Contractors: Fischbach, Moore and Morrissey, Inc., Emerson-Comstock Co., Inc., J. Livingston & Co., Air Conditioning by Carrier Corporation. Rental Agent: L. J. Sheridan & Co., Chicago.



Continued from preceding page

Honeywell Electronic Air means impressive

Electronic Controls will save thousands of dollars

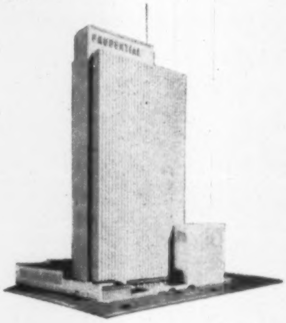
Without Honeywell Electronic Control

203

CHECK POINTS

203 points would have to be checked and adjusted at the individual control sites.

Heart of the electronic master control system will be a basement control panel. From this one location a trained operator can read and adjust the setting of 203 master electronic thermostats—all *remotely*. These thermostats will be located on the water, primary air, cooling and heating systems. It is estimated the integration of the control system with the electronic controls and panels will eliminate 2 degrees of overheating, 2 degrees of overcooling and make checking, calibrating and maintenance easier, simpler, and considerably less expensive. This will make possible an annual saving of thousands of dollars in maintenance and operation.



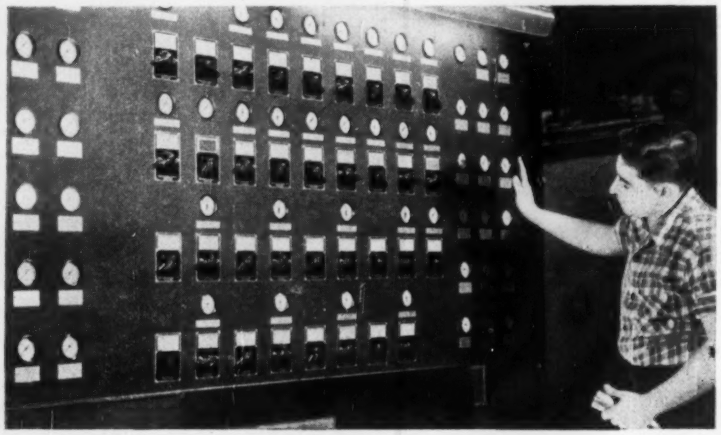
With Honeywell Electronic Control

1

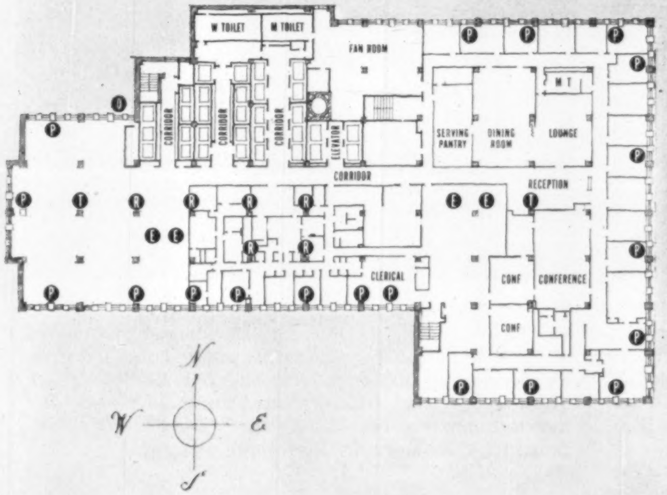
CHECK POINT

An operator at a panel in the basement will be able to check and *adjust* all 203 stats remotely.

From a single control panel in the basement (a typical panel is shown here), an operator will check and *adjust* the indoor weather throughout the huge building. He'll do it by pushing a button to check, and moving a knob if adjustment is necessary. Development of electronic controls has made such scientific control possible. Only from Honeywell can you obtain the electronic controls and the instrumentation to provide such performance.



Conditioning Control economy of performance, maintenance



T	ELECTRONIC INDICATION
P	PNEUMATIC UNIT THERMOSTAT
E	ELECTRONIC DUCT THERMOSTAT
R	ELECTRIC ROOM THERMOSTAT
O	OUTDOOR ANTICIPATOR

Strategic location of thermostats is indicated by the letters on the floor plan. "E" stands for electronic, "P" for pneumatic, "R" for electric and "T" for electronic indicating thermostat.

The function of the electronic controls is explained on the left hand page.

The pneumatic *room* thermostats you see here will guard comfort in individual offices around the perimeter of the building. The electric thermostats will control temperature in inner offices. The electronic indicating thermostats will be connected to the basement control panel.

OFFICE BUILDING comfort and efficiency will come of age—*electronic age*—when the huge new Mid-America Home Office building of The Prudential Insurance Company of America is completed in Chicago.

For super-sensitive electronic air conditioning controls will mastermind the ideal indoor weather to be provided throughout the building by Honeywell Customized Temperature Control.

These electronic controls, developed by Honeywell after years of research and testing, are far more sensitive than ordinary controls. Yet they're far simpler in construction, have no moving parts to get out of order.

Over a period of just a few years electronic master controls in the Prudential building will pay for themselves—at an estimated yearly rate of saving of 27% of the original cost. How this saving will be made is explained at left.

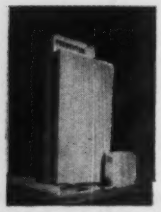
As in every building with Honeywell Customized Temperature Control, all controls in the Prudential building will be part of an integrated system.

All thermostats will play an important role in combatting use and occupancy comfort problems.

Another function these strategically placed thermostats will easily handle is exposure compensation. If the wind from Lake Michigan to the east is strong and cold, thermostats on that side will call for more heat. And when the summer sun beats down on the south face of the building, thermostats *there* will call for more cooling.

Of greatest significance, however, to the future of comfort controls in the buildings of America is the *electronic* phase of the Prudential installation. It will set the pattern for years to come.

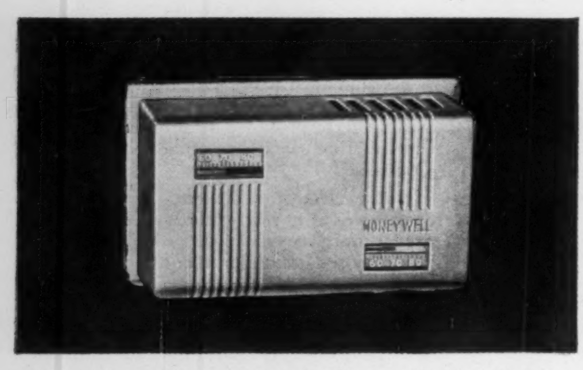
The Electronic Temperature Control story of the new Prudential building continues on the next page



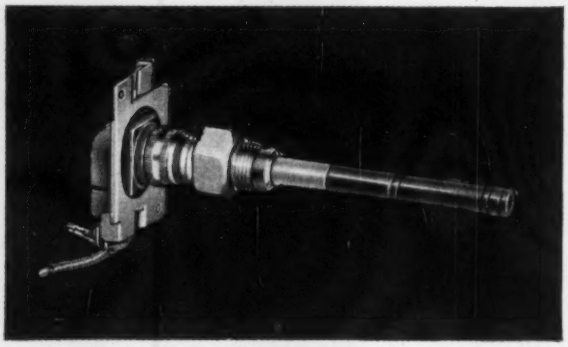
Continued from preceding page

Honeywell Electronic Air Conditioning Control for the new Prudential building in Chicago

Here are the thermostats that will be used



Room Thermostat. This is the famous Honeywell Pneumatic Grad-U-Stat. It will control both heating and cooling in rooms of the 41-story Prudential building. Visible on the wall, it will allow tenants and employees to adjust the temperature to meet particular *room* conditions. To see how these thermostats will be located, refer to the floor plan on the preceding pages.



Electronic Thermostat. This is the electronic thermostat that will be used in the Prudential building. Two-hundred seventy-six will be installed in the master control system. Of this number, 203 will be *adjustable from the control panel.* These stats—which will be located inside duct work, and therefore not seen by tenants—are ⅓ the size of conventional stats, yet are many times more sensitive.

For the finest, most modern temperature control in new or existing buildings—of any size—use Honeywell Electronic Temperature Control

Whether it's an office building, shopping center, factory, motel, hospital, school—or any size building—new or existing, Honeywell Electronic Temperature Control can help you give your clients the finest control in the world.

This includes control of heating, ventilating and air conditioning. And it includes control of processing—to help make industrial clients' operations more efficient.

Your clients will not only enjoy more comfort and efficiency, they'll save fuel, too.

For full facts on Honeywell Electronic Temperature Control, and how it can help meet *your* problems, call your local Honeywell office.

MINNEAPOLIS
Honeywell

Electronic Controls

H
HONEYWELL

112 OFFICES ACROSS THE NATION

NO Reducing Valve Needed

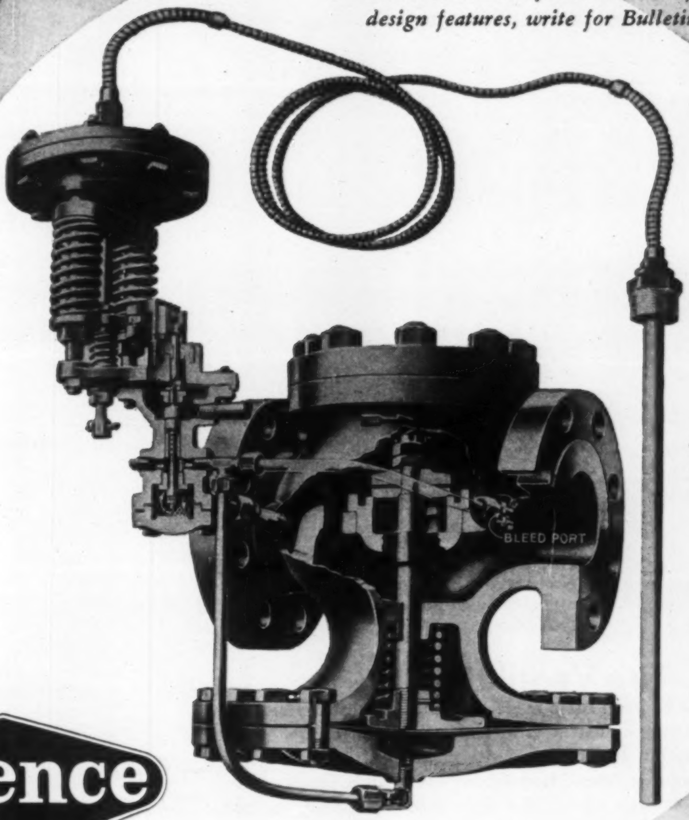
Here's real economy in temperature control.

Because Spence Temperature Regulators are designed to limit heater steam pressures to an adjustable maximum, the need for a separate reducing valve is completely eliminated.

The Spence Regulator takes steam directly from the boiler or high pressure line, reduces the pressure and regulates the flow as required to maintain a constant temperature output from the heater.

This means one relatively small combination pressure and temperature regulator replaces a reducing valve of the same size and a larger temperature regulator. Practically the entire cost of the large separate temperature regulator is saved. And, the total saving would also include the cost of a 3-valve by-pass along with all labor for installation.

This design feature is just one of the reasons for the thousands of Spence installations throughout American industry. *For details of other important design features, write for Bulletin T50.*



SPENCE TYPE ET150 Temperature Regulator

Spence

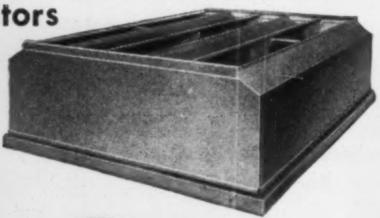
SPENCE ENGINEERING COMPANY, INC.
WALDEN, NEW YORK

Swartwout

Roof Ventilators and Ventilating Louvers

This picture catalog of Swartwout Products reminds you that equipment for efficient ventilation of industrial, commercial and institutional buildings is available from *one convenient source* — experienced ventilator manufacturers since 1904. Representatives in all principal cities are ready to help you select the best and most economical installation for your requirements.

Gravity Ventilators



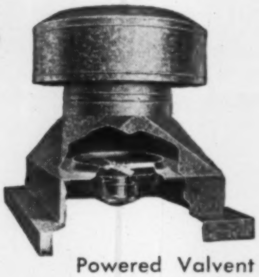
Airmover

Gravity Valvent

Rotary

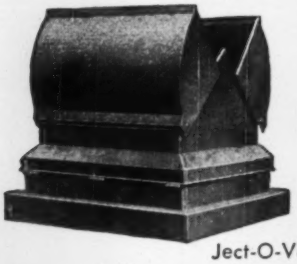
Dexter Heat Valve

Powered Ventilators

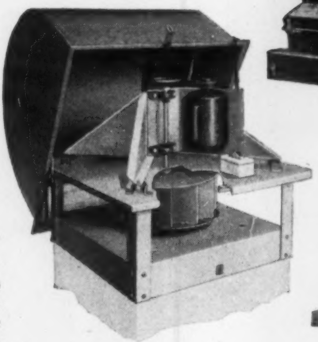


Powered Valvent

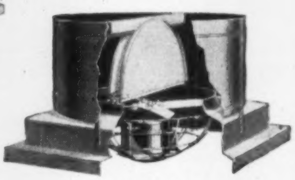
Airjector



Ject-O-Valve

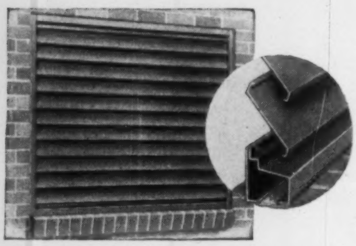


Airlift (duct exhaust)



Whirlout

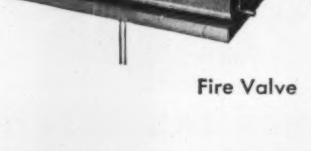
Louvers



Swartwout Airlouvers are weathertight. Overlapping blades, fixed or adjustable. Unusual size range enables you to fill any opening with equal-size louver units.

Fire Ventilation

There's a growing demand for a means of quickly releasing smoke, heat and fumes from industrial and commercial buildings when fire occurs. Swartwout Fire Valve is designed specifically for this purpose. Two large dampers drop open when high temperature melts fusible links. Each Fire Valve unit provides 46 sq. ft. free opening. Only 21 in. high. Weatherproof when closed. Also serves as emergency ventilator.



Fire Valve

Write for condensed catalog, Bulletin 349

THE SWARTWOUT COMPANY **18568 Euclid Ave., Cleveland 12, Ohio**

Evans Lifelong

Air Filters

SEE THEM ON DISPLAY

Jan. 24-28 Booth C-153

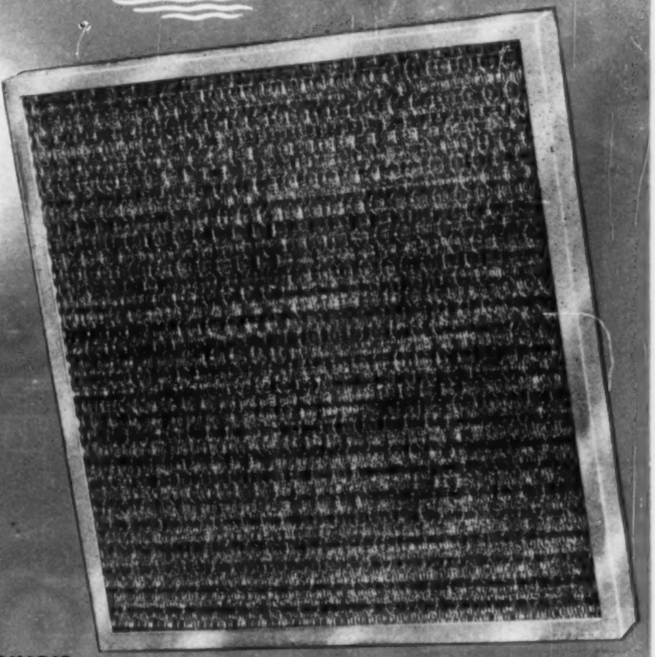
12th International Heating & Ventilating Exposition — Philadelphia

A COMPLETE LINE of INDUSTRIAL COMMERCIAL & GREASE FILTERS

Every part precision made and fitted. All aluminum. Cleans air cleaner. Catches and holds more lint. Stops matting problems. Holds more than double the dirt load with less than one-half peak resistance to air flow. Clean with tap water. No special equipment needed . . . no fireproof room or caustic cleaning fluids necessary.

Write for FREE complete information.

THE GEORGE EVANS CORP. · MOLINE, ILLINOIS



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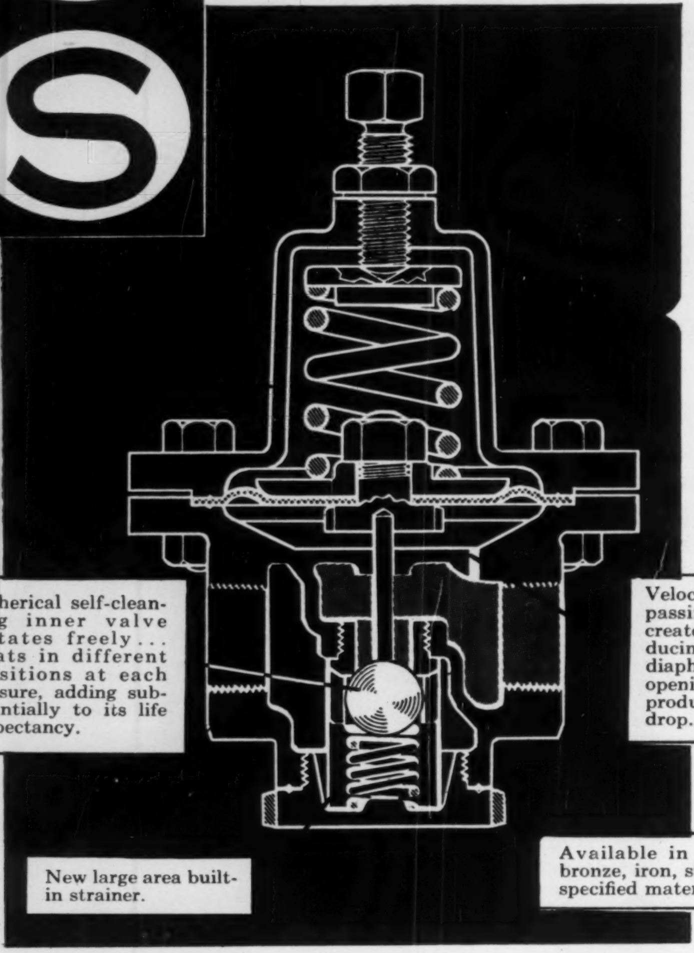
THE LATEST CASH STANDARD VALVE

TYPE 1260

CS

Direct Operated • Self Contained • Single Seat
Pressure Reducing and Regulating



Spherical self-cleaning inner valve rotates freely . . . seats in different positions at each closure, adding substantially to its life expectancy.

Velocity of gas or liquid passing the body port creates suction, thus reducing pressure in lower diaphragm chamber and opening valve wider to produce lower pressure drop.

New large area built-in strainer.

Available in aluminum, bronze, iron, steel or other specified materials.

WITH EXCLUSIVE DESIGN* for . . .

- Extremely LOW PRESSURE DROP and LOCKUP
- MINIMUM SIZE and WEIGHT with MAXIMUM SENSITIVITY
- LOWER INITIAL COST
- LONGER LIFE
- EASY SERVICING without removing from pipeline
- UNIVERSAL APPLICATION: water, gas, steam, air, oil & other non-corrosive fluids
- 300 psi INLET PRESSURE . . . 3 to 250 psi DELIVERED PRESSURE

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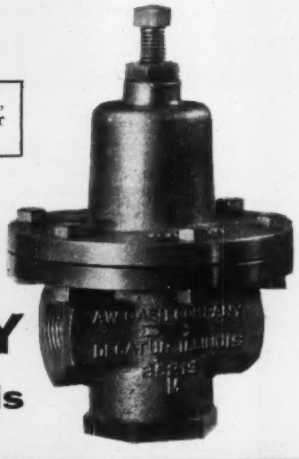

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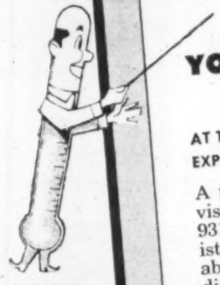
A. W. CASH COMPANY
P. O. Box 551 • Decatur, Illinois

PRESSURE, HYDRAULIC, TEMPERATURE, PROCESS AND COMBUSTION CONTROLS



Billy BTU

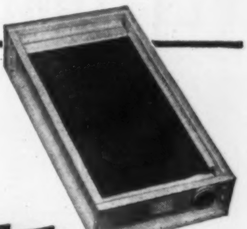
You're Invited to the

YOUNG RADIATOR COMPANY BOOTH 931

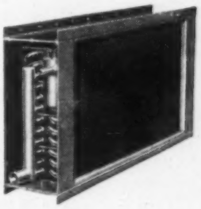
AT THE 12TH INTERNATIONAL HEATING & VENTILATING EXPOSITION • PHILADELPHIA, PA. • JANUARY 24-28

A pleasant way to start your "show tour" is to visit the Young Radiator Company booth No. 931. You'll be mighty welcome and our specialists will be on hand to answer all your questions about Young Heating, Ventilating and Air Conditioning Products . . . both established and new. Illustrated here are a few of the outstanding Young Products which will be exhibited. Stop in . . . we'll be expecting you.

COILS

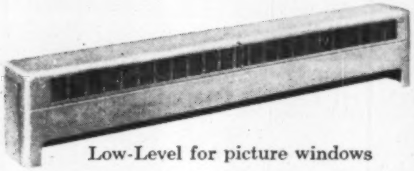


Heating Coils

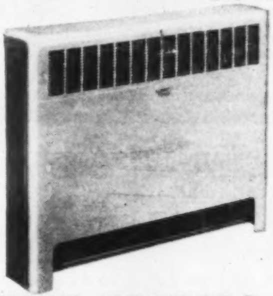


Cooling Coils

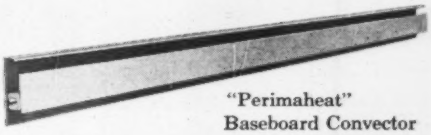
CONVECTORS



Low-Level for picture windows

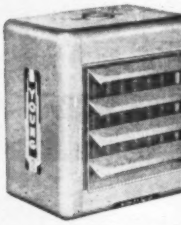


Standard free-standing, wall-hung, semi-recessed and fully-recessed types.



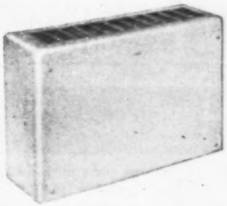
"Perimaheat"
Baseboard Convector

UNIT HEATERS

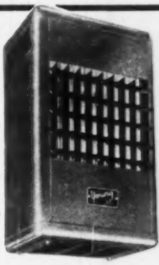


Horizontal Discharge type

Vertical Discharge type

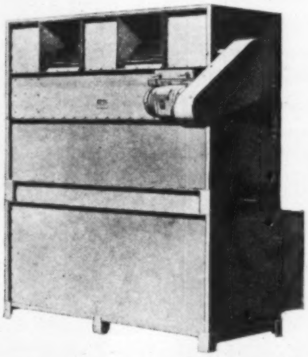


Cabinet type

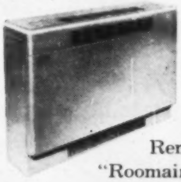


Gas Fired
Horizontal type

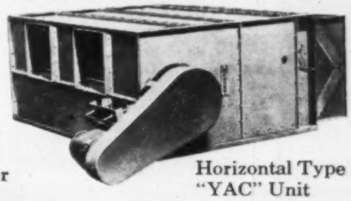
AIR CONDITIONING UNITS



Vertical Type "YAC" Unit



Remote Type
"Roomaire" Conditioner



Horizontal Type
"YAC" Unit

Young **RADIATOR COMPANY**

RACINE, WISCONSIN

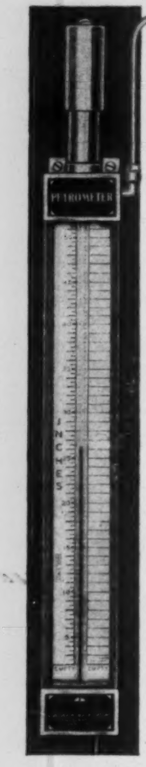
Creative HEAT TRANSFER ENGINEERS FOR INDUSTRY

Heat Transfer Products for Automotive and Industrial Applications.

Heating, Cooling, Air Conditioning Products for Home and Industry.

Executive Office: Racine, Wisconsin, Plants at Racine, Wisconsin, Mattoon, Illinois

PETROMETER *Remote Reading* LIQUID DEPTH GAUGES



FOR: Industrial and Domestic Oil Burner Installations
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Complete Tank Assembly

OUTSTANDING FEATURES:

1. Simple, trouble-free design—No mechanical or electrical gadgets. Operates on unfailing principle of static pressure.
2. Constant Accuracy—Large vertical scale, with clearly visible red liquid column, gives constant, accurate readings.
3. Easy Installation—Gauges can be installed on tanks above or below the ground and up to ¼ mile from the tank. Tank assembly can be installed even when there is liquid in the tank.

Complete measuring unit consists of the Petrometer Gauge and a tank assembly unit. The latter consists of a ¼" copper tube transmission line and an air bell which is positioned at the bottom of the tank. Just one simple connection to tighten at the gauge.

HOW TO SELECT THE PETROMETER:

1. Determine the maximum depth of liquid in the tank when it is full.
2. Determine the specific gravity, Baume or API of the liquid in the tank. (Or fuel oil number).

Select the right gauge from the table below. To obtain correct length of tank assembly measure the distance from the gauge to the bottom of the tank. Tank assemblies are supplied in multiples of 10 feet.

LIQUID		VERTICAL TANK DEPTHS					
	BAUME	USE TYPE 112	USE TYPE 114	USE TYPE 225	USE TYPE 227	USE TYPE 339	USE TYPE 3312
GASOLINE	60°	1" to 58"	to 84"	to 97"	to 129"	to 159"	to 192"
FUEL OIL #1	40°	1" to 52"	to 74"	to 87"	to 115"	to 142"	to 171"
FUEL OIL #2	35°	1" to 51"	to 73"	to 85"	to 112"	to 138"	to 167"
FUEL OIL #3	30°	1" to 48"	to 70"	to 82"	to 108"	to 134"	to 162"
FUEL OIL #4	25°	1" to 47"	to 68"	to 79"	to 104"	to 129"	to 156"
FUEL OIL #5	20°	1" to 46"	to 67"	to 77"	to 102"	to 126"	to 152"
FUEL OIL #6	15°	1" to 44"	to 65"	to 75"	to 99"	to 121"	to 146"
WATER	10°	1" to 43"	to 62"	to 72"	to 95"	to 117"	to 141"

BOARD OF STANDARDS AND APPEALS CITY OF NEW YORK

SOME OF THE LIQUIDS THAT CAN BE MEASURED INCLUDE:

Fuel Oil
Water
Gasoline
Kerosene
Benzine
Lube-Oil
Acids
Alcohol
Naptha
Acetone
Silicate of Soda
Insecticides
Sewage
Asphalt
Food Oils
Paints
Varnishes
Waxes

LIQUIDEPTH SAFETY CLEANOUT VALVE

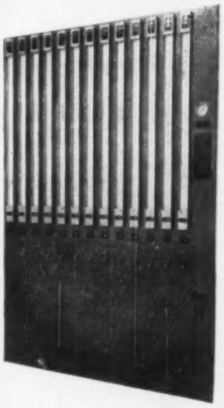
Here is the perfect partner for your PETROMETER TANK GAUGE. The LIQUIDEPTH CLEANOUT VALVE provides safe, easy, vapor-tight access to tank bottoms—from a remote point—for quick REMOVAL of WATER and SLUDGE.

Fool-proof features ELIMINATE the danger of FIRE and EXPLOSION where volatile liquids are stored in buried systems. All integral parts are made of non-sparking brass, bronze and phosphor bronze. The Liquidepth Safety Cleanout Valve is actually a combination of three valves, each operating independently and automatically.

LIQUIDEPTH BLOWOUT GUN

For cleaning out clogged instrument transmission lines and other lines where no automatic means for blowing-out are provided. Uses CO_2 cartridge. Completely safe for all petroleum products. Incorporates ¼" female pipe connection that can be adapted to any fitting that may be encountered. For use with other liquids, check with liquid supplier.

Industrial Gauges & Controls:



LIQUIDEPTH also manufactures a complete line of industrial Liquid Depth Gauges and Liquid Level Controls for the chemical, petroleum, paint, food and other process industries, for marine dry docks, bulk storage plants and many other applications. Liquidepth also designs multi-gauge panel units for central control systems.

Send today for Bulletin 2004

LIQUIDEPTH INDICATORS
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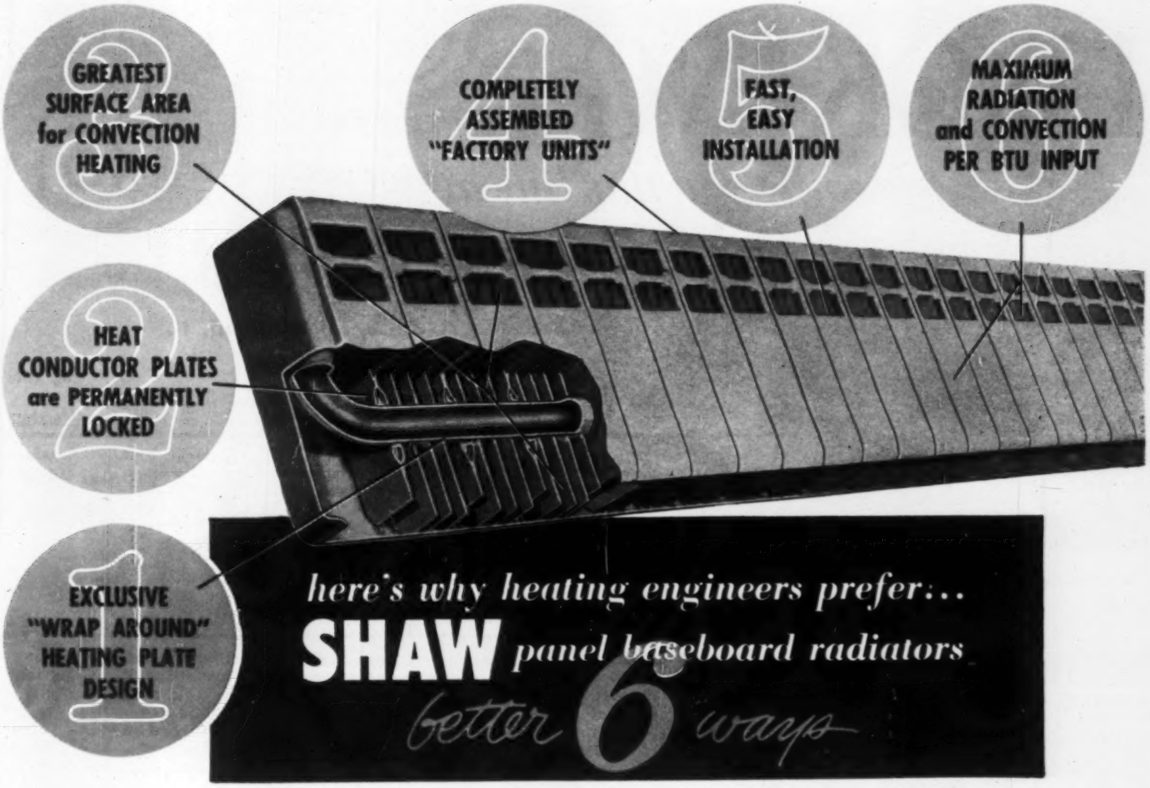
43-22 TENTH STREET • LONG ISLAND CITY 1, N.Y.


GREATEST SURFACE AREA for CONVECTION HEATING
COMPLETELY ASSEMBLED "FACTORY UNITS"
FAST, EASY INSTALLATION
MAXIMUM RADIATION and CONVECTION PER BTU INPUT
HEAT CONDUCTOR PLATES are PERMANENTLY LOCKED
EXCLUSIVE "WRAP AROUND" HEATING PLATE DESIGN
here's why heating engineers prefer...
SHAW panel baseboard radiators
better 6 ways

Specify... SHAW

for a perfect ratio of convection-radiant *Air-e-ated* heat

The men who deal in BTU's have recognized the tremendous plus-values of Shaw's engineered panel baseboard radiators. The need for rugged and efficient heating equipment in Schools, Hospitals, Churches, Factories, Offices, Ships and in the Home is fully met with Shaw's new high standard in quality heating.

Shaw's Air-e-Ated panel baseboard radiators set the pace for beauty and modern design that can readily be made to blend or harmoniously contrast with the functional decor of the modern home or office.

Let us show you how Shaw's Air-e-Ated heat can give new living comfort with the highest *quality* heat and at the lowest BTU cost input. Insist on the best . . . Shaw-Perkins for efficient long-life, beauty and versatility.

1 Exclusive "Wrap Around" heating plate design provides positive lock-contact with copper coil for maximum heat conduction . . . without weakening or prestressing coil.

2 Heat conductor plates are permanently locked to all sides of sidewalls. This provides maximum radiation by eliminating insulating air barrier between convection plate and radiation surface. Fast, quiet heat . . . plus extreme rigidity.

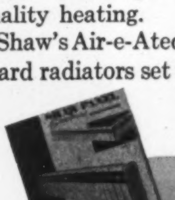
3 Greatest surface area for convection heating. Conductor plates run entire height and depth of every unit and are spaced ½" apart for maximum air circulation and minimum dust matting. Each lineal foot of Shaw Unit provides over 8 square feet of heating surface.

4 Completely assembled "factory units" are all 8" high and only 3" thin. Any number of factory units are easily and quickly joined to form length desired. Straight run, inside and outside corner radiators with three tapping arrangements for right or left and opposite end supply and return piping connections . . . all join simply to provide a modern, beautiful design.

5 Fast, easy installation. Rugged factory units are easily joined into one complete radiator . . . no cutting to length . . . no parts to screw together . . . nothing to rattle. Impervious to high pressures, vibration and thermal expansion. Just screw to wall and connect supply and return ends to steam or hot water supply.

6 Maximum radiation and convection per BTU input. Rating—6.7 square feet E.D.R. average per lineal foot based on 1# steam and 65° F. inlet air. Exclusive Shaw heavy-duty construction and wide spaced, dust-proof plates, assures you of highest heating efficiency that will not change through long years of service.

See our complete listing in Sweet's Catalog.



SP-1

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MANUFACTURING CO.
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LOOKING *forward to*

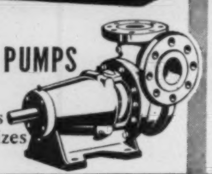
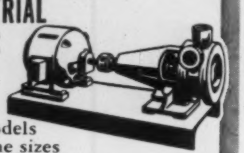
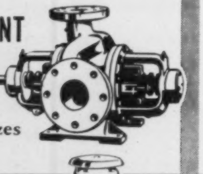
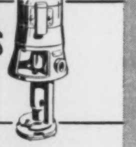
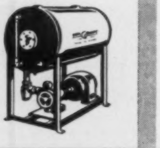
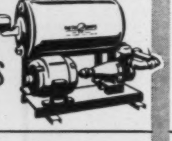
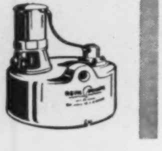
showing you this line at BOOTH No S-1

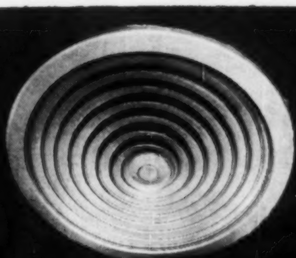
ROTH PUMPS

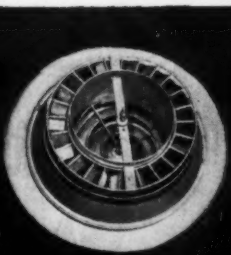
Made by the people who SPECIALIZE in regenerative turbine pumps.

ROY E. ROTH COMPANY

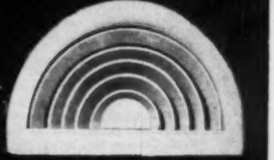
2476 4th Avenue, Rock Island, Ill.

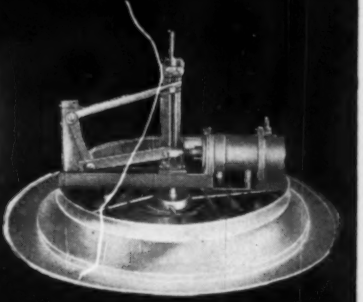
	CONSTRUCTION	MATERIALS	SERVICE	DELIVERY	Eng. Data or Literature
CHEMICAL PUMPS  • 27 models • 2 frame sizes	• End mounted, single stage, vertically split, ball bearing, horizontal shaft, flexible coupled. Choice of Duraseals, John Crane seals, or packing. 300 lb. ASA flanged connections, 1 inch to 2½ inches. Rugged construction. Mechanical evaluation data on request.	Stocked in cast iron, zincless bronze, cast steel, 316 stainless steel, and Hastelloy "C". Available to order in 304 or 347 stainless steel, ampco metal, monel or nickel.	For acids, caustics, liquefied gases, and solvents in heads up to 700 ft. and capacities from 1 to 100 GPM. NPSH rated.	Average four weeks from stock materials or twelve weeks for special orders.	Catalog Section 100.
INDUSTRIAL PUMPS  • 65 models • 7 frame sizes	• End Mounted, single stage, vertically split, ball bearing, horizontal shaft, flexible coupled. Choice of John Crane seals, rotary seals, or packing. 125 lb. ASA screwed connections except flanged on 3 inch models.	Cast iron, all bronze, bronze fitted.	Boiler feed, condensate return, pressure booster, circulating. Water, hydrocarbons, refrigerants. Heads to 350 ft. Capacities to 180 GPM. NPSH rated.	Based on current status of stock and Scheduling. Average two to four weeks.	Catalog Section 101.
POWERPLANT PUMPS  • 36 models • 4 frame sizes	• Center mounted, double stage, vertically split, horizontal shaft, flexible coupled. Balanced stages. Low pressure stuffing box with throttle bushing and pressure bleeder. Double row ball bearings. 300 lb. ASA flanged connections, 2" to 4."	Cast iron, bronze, cast steel, stainless steel.	Feedwater, condenser, or heater service. Heads up to 700 ft. Capacities up to 280 GPM. NPSH as low as 2 ft.	Average 12 weeks.	Catalog Section 107 (in process)
VERTICAL PUMPS  • 14 models • 1 frame size	• Sump mounted, submerged liquid end, single and two stage, regenerative turbine only.	Cast iron, bronze, bronze fitted.	Condensate return in capacities to 15 GPM and 200 ft. heads.	2 to 4 weeks in bronze fitted or all iron. 12 weeks in all bronze.	Catalog Section 104 (in process)
BOILER FEED UNITS  • 148 models • 6 tank sizes	• Roth turbine pump and receiver tank fully assembled with connecting pipe and strainer, gauge glass, and automatic make-up water valve. Controlled by boiler water level controller.	Corrosion resistant lined or 3/16" steel receiver up to 750 gal. capacity. Bronze fitted or standard pumps. Mechanical seals when specified.	Steam boilers up to 600 HP and 200 PSI. Sized for intermittent service. Controlled by boiler water level controller.	2 to 8 weeks depending on special features required.	Catalog Sections 201, 202, and 203.
HORIZONTAL CONDENSATE RETURN UNITS  • 310 models • 10 tank sizes	• Roth pump and receiver, together with connecting piping, gauge glass, and float switch or alternator assembled as a unit.	Corrosion resistant lined or 3/16" steel receiver. Bronze fitted pump. Nationally accepted float switch and motor.	For steam heating systems up to 100,000 sq. ft. EDR.	2 to 12 weeks depending on special features required.	Catalog Sections 210 and 211.
VERTICAL CONDENSATE RETURN UNITS  • 60 models • 2 tank sizes	• Vertical submerged pump, sump mounted in receiver.	Bronze fitted pump. Cast iron receiver. Nationally accepted switch and motor.	Condensate return to 10,000 sq. ft. EDR or 80 PSI.	2 to 4 weeks average.	Catalog Section 212.





a model for every diffuser need FLEXIFLO



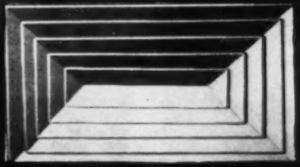


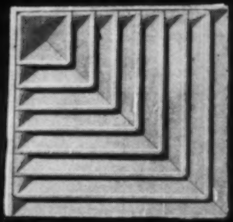
- CIRCULAR • SQUARE
- RECTANGULAR • ADJUSTABLE
- AUTOMATIC

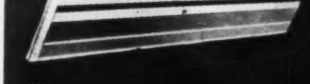
All FLEXIFLO diffusers are styled simply, beautifully . . . finished in baked enamel of any desired color . . . extra features include built-in equalizing deflectors . . . simple, easy installation and removal of diffuser cores with just a "twist of the wrist."

A COMPLETE LINE OF DIFFUSER ACCESSORIES

Let a trained FLEXIFLO sales engineer help you solve your air distribution problem. Representatives in major cities throughout the U.S. and Canada.







FLEXIFLO

UNIVERSAL DIFFUSER CORP.
1360 GARRISON AVE., NEW YORK 59, N.Y.

UNIVERSAL DIFFUSER CORPORATION
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WATER SAVER Model QT. 3 and 5 ton sizes. Bulletin QT-1.

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ST. LOUIS 17, MO.

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Heating, Piping & Air Conditioning

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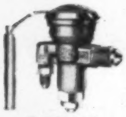
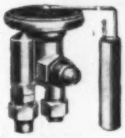
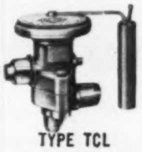
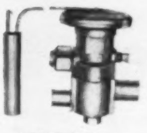
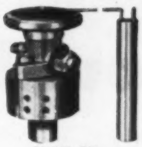
THERMO EXPANSION VALVES


TYPE 402
with pressure limiting feature


TYPE TK
"3 valves in 1"

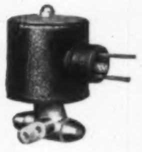

TYPE TCL
with angle connections


TYPE TCL
with straight-thru connections

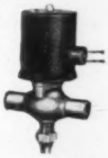

TYPE TR
Multi-Outlet

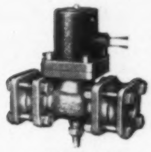
For automatic control of liquid refrigerant on all types of refrigeration and air conditioning systems. Capacities: from fractional tonnage to 220 tons Freon-12, 350 tons Freon-22; selective charges. Low temperature valves for −40°F to −100°F.

SOLENOID VALVES


TYPE S1

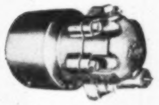
TYPE S2


TYPE M3

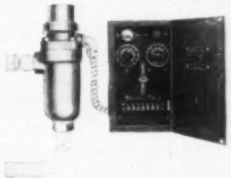

TYPE R2

For all types of service. For liquid: Freon-12 up to 75 tons; 110 tons Freon-22. For suction: Freon-12 up to 10 tons; 15 tons Freon-22. For brine, water, steam, hot gas discharge, air and oil.

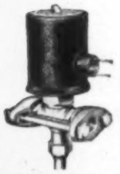
FLOAT VALVES AND SWITCHES

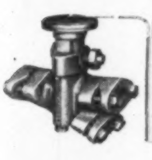

TYPE HK
high pressure float valve. Up to 5 tons Freon-12, 8 tons Freon-22 and 20 tons Ammonia.

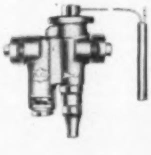
TYPE J5
electric float switch. For Freon, Methyl Chloride, Ammonia and other non-corrosive liquids having a specific gravity of .5 or more. Up to 230 volts AC or DC.

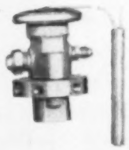

908 LECTRO-LEVEL
electronic remote control of liquid level. Accurate control for full-flooded evaporators. Adjustable to a wide range of level changes. Easy-to-set control dials conveniently mounted in remote box.

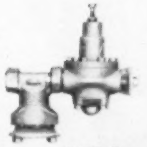
AMMONIA CONTROLS


TYPE M91F


TYPE TG


TYPE UG


TYPE TX


TYPE E
with strainer

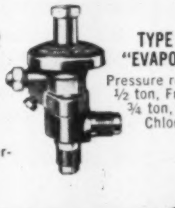
Solenoid Liquid Valves – up to 172 tons. Solenoid Suction Valves – up to 28 tons. Thermo Expansion Valves – from fractional tonnage to 125 tons. Automatic Expansion Valves – from fractional tonnage to 60 tons.

SUCTION LINE CONTROLS

TYPE EPR EVAPORATOR PRESSURE REGULATORS

For all refrigerants, with connection sizes up to 6"

TYPES 771-772 SUCTION PRESSURE REGULATORS
(Hold-Back Valves)
Prevent motor overload. Freon-12, Freon-22.


TYPE 760 "EVAPOTROL"
Pressure regulator – ½ ton, Freon-12 – ¾ ton, Methyl Chloride.

the complete line of refrigerant controls

ALCO

For capacities in excess of those listed, write us and give specific requirements.

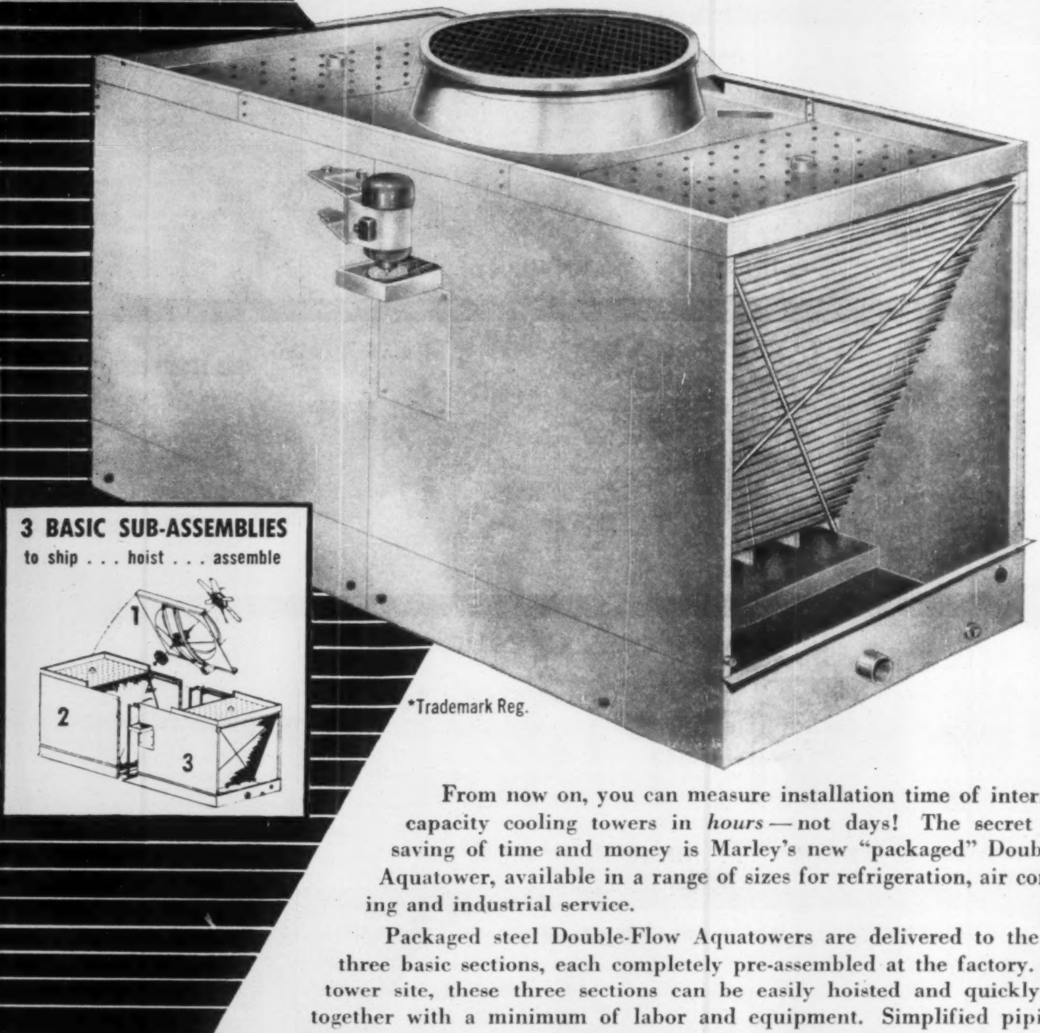
SEE YOUR ALCO WHOLESALER

ALCO ALSO OFFERS YOU
Constant Pressure (Automatic) Expansion Valves—Reversing Valves—Liquid and Suction Line Strainers.

ALCO VALVE CO.
861 KINGSLAND AVE. • ST. LOUIS 5, MO.

New "PACKAGED" Double-Flow* Aquatowers

[illegible] the calendar for a CLOCK



*Trademark Reg.

From now on, you can measure installation time of intermediate capacity cooling towers in *hours* — not days! The secret to this saving of time and money is Marley's new "packaged" Double-Flow Aquatower, available in a range of sizes for refrigeration, air conditioning and industrial service.

Packaged steel Double-Flow Aquatowers are delivered to the job in three basic sections, each completely pre-assembled at the factory. At the tower site, these three sections can be easily hoisted and quickly bolted together with a minimum of labor and equipment. Simplified piping and grillage also help cut erection cost to a fraction of the normal installation expense for towers of like capacity.

Marley's unique new towers offer every operation economy of larger Double-Flow Aquatowers, every installation economy of packaged Marley Aquatowers. For complete data on design, construction, engineering and performance, just call your Marley Application Engineer in any of 55 cities.

To be shown in Booth 325 at the International Heating and Ventilating Exposition

MARLEY

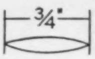
The Marley Company
Kansas City, Missouri

AirFoil
AIR CONDITIONING OUTLETS

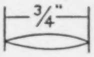
designed by **TITUS**

TITUS SPECI

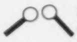
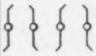
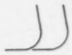
TITUS SUPPLY GRILLES (see note A)

STYLE	APPLICATION	LOUVER DESIGN	LOUVER SPACING	APPEARANCE
L-271	Sidewall. 2-way directional control. Up or down.	 Airfoil. Solid Section. Extruded aluminum.	3/4" on centers.	One set individually adjustable louvers parallel long dimension.
S-271	Sidewall. 2-way directional control. Right or left.	Same as above.	Same as above.	Same as above except louvers parallel to short dimension.
L-270	Sidewall. 4-way control. Up, down, right or left.	Same as above.	Same as above.	Two sets louvers. Front parallel long dimension. Rear parallel short dimension. Individually adjustable.
S-270	Sidewall. 4-way control. Right, left, up or down.	Same as above.	Same as above.	Same as above except front parallel short dimension. Rear parallel long dimension.

TITUS SUPPLY REGISTERS FOR COMPLETE SHUTOFF AND VOLUME CONTROL

L-274	Sidewall. 2-way directional control. Up or down plus shutoff.	 Airfoil. Solid Section. Extruded aluminum.	Front louvers . . 3/4" on centers	Front louvers parallel long dimension. Individually adjustable.
S-274	Sidewall. 2-way directional control. Right or left plus shutoff.	Same as above.	Same as above.	Front louvers parallel short dimension. Individually adjustable.
L-275	Sidewall. 2-way directional control. Up or down plus opposed action volume control.	Same as above.	Same as above.	Front louvers parallel long dimension. Individually adjustable.
S-275	Sidewall. 2-way directional control. Right or left plus opposed action volume control.	Same as above.	Same as above.	Front louvers parallel short dimension. Individually adjustable.
L-276	Sidewall. 4-way directional control. Up, down, right or left plus shuttoff.	Same as above.	Front two sets . . 3/4" on center.	Two sets individually adjustable louvers Front parallel long dimension. Second set parallel short dimension.
S-276	Same as above.	Same as above.	Same as above.	Same as above except front set parallel short dim. and second set — long dim.
L-277	Sidewall. 4-way directional control. Up, down, right or left. Opposed action volume control.	Same as above.	Same as above.	Two sets individually adjustable louvers. Front set parallel long dimension. Second set parallel short dimension.
S-277	Same as above.	Same as above.	Same as above.	Same as above except front set parallel short dim. and second set — long dim.

TITUS VOLUME CONTROLLERS (see note B)

AG-25	In duct behind grille or at junction of duct and branch takeoff.	 Airfoil. Solid Section. Extruded aluminum louver.	1-1/2" on centers.	1-1/8" each section. 2-1/4" total. Hinged for greater adjustability each section. Individually adjustable.
AG-35	Attached to grille or in duct behind grille.	 20 gauge steel.	1" on cent. Pivoted on center. Opposed acting.	Gang operation. Full open to full closed. Blades always parallel short dimension.
AG-45	Attached to duct behind grille or at junction duct and branch takeoff.	 22 gauge steel.	1" on center.	Double duty. Can move from full open to full closed. Blades always parallel short dimension.

TITUS RETURN AIR GRILLES (see note C)

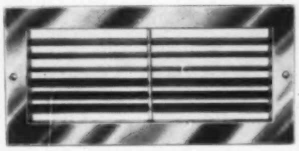
RL-230	Sidewall. To match all Titus Airfoil supplies.	Heavy steel. Curved and hemmed for added strength.	3/4" on center.	Blades fixed at 45° or 0° deflection. Parallel long dimension.
RS-230	Same as above.	Same as above.	Same as above.	Same as above except parallel to short dimension.

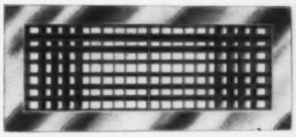
TITUS RETURN AIR REGISTERS (see note D)

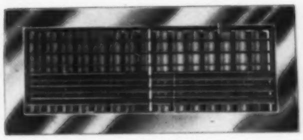
RL-240	Sidewall. Return air plus multishutter damper.	Heavy steel. Curved and hemmed for added strength.	3/4" spacing in front.	Front blades fixed at 45° or 0°. Parallel long dimension.
RS-240	Same as above.	Same as above.	Same as above.	Same as above except parallel to short dimension.
RL-241	Sidewall. Return air plus opposed action damper.	Same as above.	Same as above.	Front blades at 45° or 0° deflection. Parallel long dimension.
RS-241	Same as above.	Same as above.	Same as above.	Same as above except parallel to short dimension.

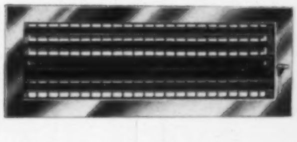
FICATION DATA

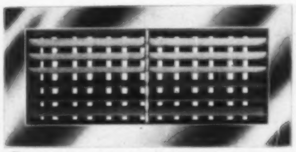
FRAME	DAMPER	DAMPER CONTROL	Approx. Free Area
1¼" ¼" Wide beveled edge. 18 or 20 ga. steel.	None	None	80%
Same as above.	None	None	80%
Same as above.	None	None	80%
Same as above.	None	None	80%
1¼" ¼" Wide beveled edge. 18 or 20 ga. steel.	Multi-shutter . . spaced on 1 inch centers.	Standard lever operator. Remov. lever available at no extra cost. Specify R. L. L.	80%
Same as above.	Same as above.		80%
Same as above.	AG-35 opposed action.	Removable Allen wrench operator.	80%
Same as above.	Same as above.	Same as above.	80%
Same as above.	Multi-shutter . . spaced on 1 inch centers.	Standard lever operator. Remov. lever available at no extra cost. Specify R. L. L.	80%
Same as above.	Same as above.		80%
Same as above.	AG-35 opposed action.	Removable Allen wrench operator.	80%
Same as above.	Same as above.	Same as above.	80%
Channel type. 20 gauge cold rolled steel.		None	
Same as above.		Removable Allen wrench operator.	
None		Several types remote operators. Write Main Off.	
1¼" ¼" Wide beveled edge. 18 or 20 ga. steel.	None	None	82%
Same as above.	None	None	82%
1¼" ¼" Wide beveled edge. 18 or 20 ga. steel.	Multi-shutter on 1" cent. Parallel short dimension.	Standard lever operator. Remov. lever available at no extra cost. Specify R. L. L.	82%
Same as above.	Same as above except parallel long dimension.		82%
Same as above.	AG-35 opposed action.	Removable Allen wrench operator.	82%
Same as above.	Same as above.	Same as above	82%

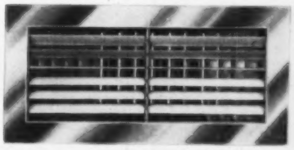

● L-271 - Supply Grille

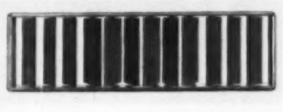

● L-270 - Supply Grille

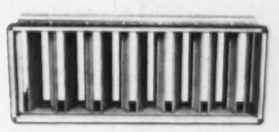

● L-274 - Supply Register

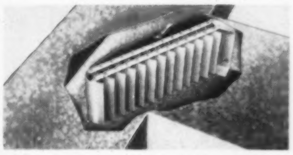

● L-276 - Supply Register

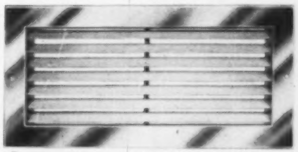

● L-275 - Supply Register

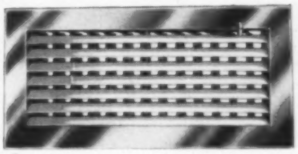

● L-277 - Supply Register

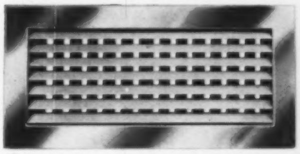

● AG-25 - Volume Controller


● AG-35 - Volume Controller


● AG-45 - Volume Controller


● RL-230 - Return Air Grille


● RL-240 - Return Air Register


● RL-241 - Return Air Register

NOTE THESE ADDITIONAL SPECIFICATIONS:

A. These added features are standard on each SUPPLY GRILLE.
  1. 1/4" sponge rubber gasket.
  2. Countersunk screwholes.
  3. Attractive softone gray lacquer finish.
  4. Special mullion support where louvers exceed 20" in length.

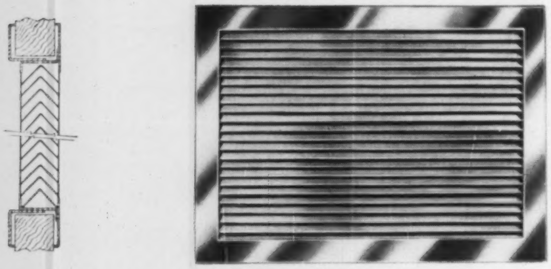
B. VOLUME CONTROLLERS have standard black lacquer finish. Gaskets furnished on all AG-25 and AG-35s. Models are designed to fit into duct by friction.

C. RETURN AIR GRILLES are made extra heavy to withstand low sidewall abuse. Finished with standard gray softone lacquer.

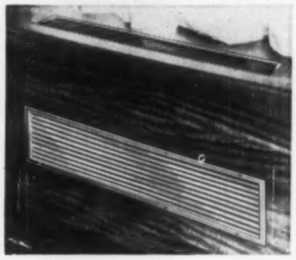
D. RETURN REGISTERS are made with extra heavy steel to withstand low sidewall use and abuse. Provide volume control or complete shutoff. Have gray softone prime finish.

AirFoil

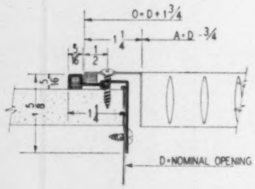
AIR CONDITIONING OUTLETS



SERIES T-700 AUXILIARY FRAME No-Vision door and partition grilles. Strong, all steel construction. V-shaped louvers on 1/2" centers set securely in end frames. No rattle when doors are slammed. Attractive. Widely used for exhaust and return air grilles. Maximum free area, yet completely sight-proof. Available: Style A — (Channel frame for use with quarter-round). Style B — (Flanged frame in one side). Auxiliary frame shown above left available with Style B.



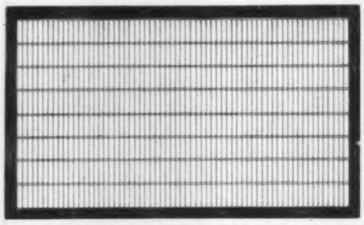
CONVECTOR GRILLES Custom designed grilles available at standard prices. Made to withstand heaviest use and abuse which lower wall grilles must take. Tamper-proof, extra-heavy support bars — over 70% free area. Available in four styles, C2100 and C2300 grilles and C2200 and C2400 registers. Write for complete catalog information on this line of grilles custom designed for use with convectors.



FRAME 115

FOR ALL AIRFOIL GRILLES AND REGISTERS

Allows quick easy removal for cleaning or adjusting. Can be installed either before or after plastering has been completed. Frame may be imbedded in plaster. Each frame has sponge rubber gasket to prevent air leakage. Edge acts as plaster lock. Designed for use with Titus Airfoil registers and grilles only.



GYMNASIUM GRILLE Made with a built-in durability that literally stops damage and replacement costs. Engineered to withstand jarring wear that school gymnasium equipment must take. Test proven to stand up under the punching impact of hard thrown basketballs and baseballs. Safety approved for school use. Smooth contours to eliminate possibility of injury. More air control per square inch. More strength per square inch. Choice of 2 models; G-1 (grille face only) and G-2 (grille face combined with volume controller).

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Cleveland, Ohio
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TITUS MANUFACTURING CORP. . . . . WATERLOO, IOWA

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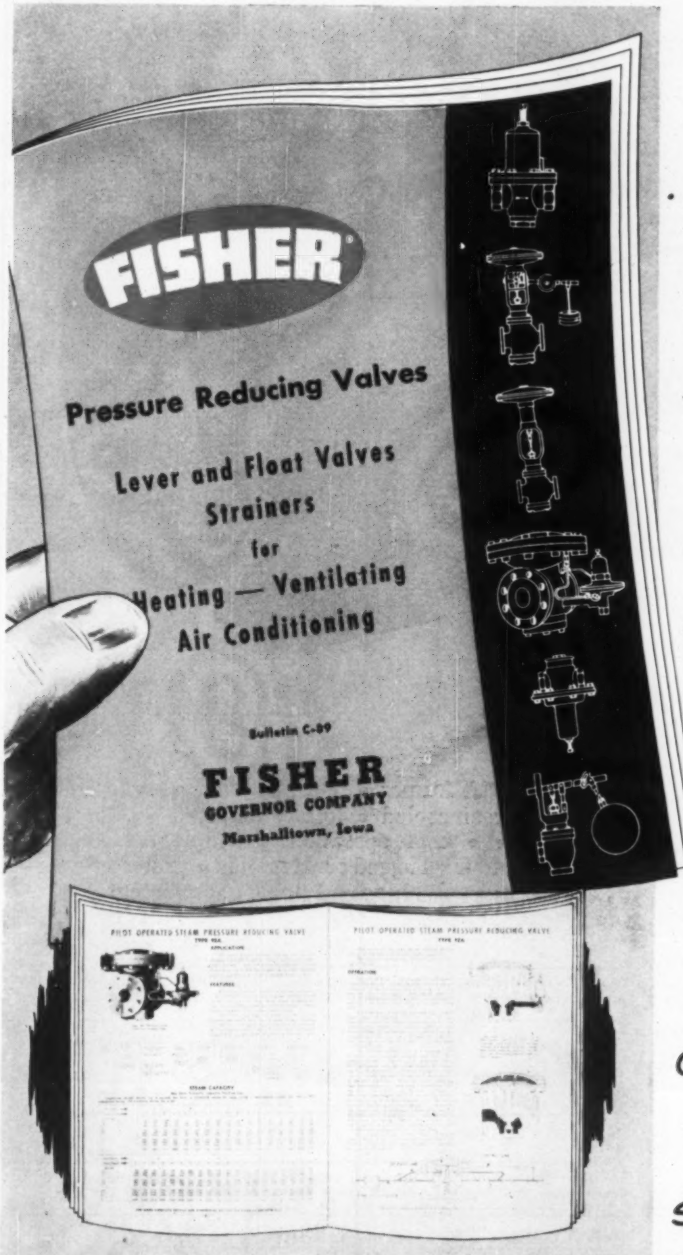

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Heating — Ventilating
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Bulletin C-89

FISHER
GOVERNOR COMPANY
Marshalltown, Iowa

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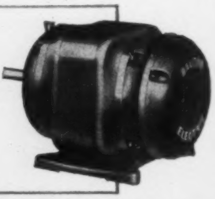
BALTRIC—Single Phase Motors, Capacitor Start, Induction Run, Horizontal Enclosed Construction, Solid Mounted, Ball Bearing, 115/230 V., 60 Cyc., Continuous Duty, 55° C. Rise, Reversible

H. P.	F. L. R. P. M.	N. E. M. A. No.	Breakdown Tq. % F. L.	F. L. % Eff.	F. L. % P. F.	Net Weight
1/3	1725	56	250	67	68	34
1/2	1725	56	250	70	68	39
3/4	1725	56	225	73	74	42

BALTRIC—Three Phase, Squirrel Cage, Induction Motor, Horizontal Enclosed Construction, Ball Bearing, Normal Torque Design B, 220/440 V., 60 Cyc., Continuous Duty, 55° C. Rise

H. P.	F. L. R. P. M.	N. E. M. A. No.	Breakdown Tq. % F. L.	F. L. % Eff.	F. L. % P. F.	Net Weight
1/2	1725	56	340	74	74	28
3/4	1725	56	320	76	76	32
1	1725	182	300	80	82	55
1½	1725	184	300	86	87	59
2	1725	184	300	88	89	62
3	1725	213	260	88	89	97
5	1725	215	240	89	89	109

BALDOR STREAMCOOLED® MOTORS
of present NEMA dimensions
are still available:
SINGLE PHASE: ¼ to 7½ h. p.
THREE PHASE: ⅓ to 20 h. p.



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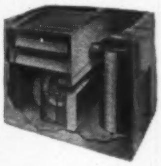
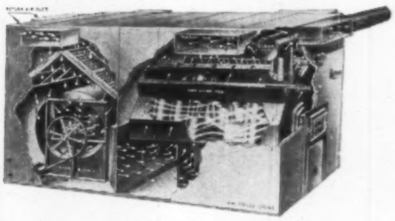


8000 SERIES For All Fuels



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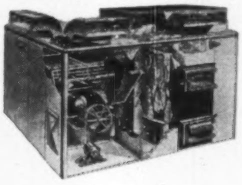
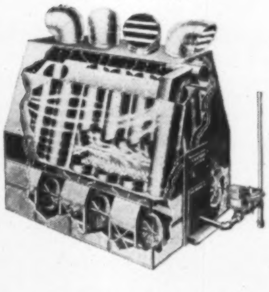


8000 UNIT HEATER
For All Fuels



SPECIFICATIONS and DIMENSIONS

Unit No.	Output Capacity Btu/Hr†	Heating Surface Sq Ft	Btu per Sq Ft Heating Surface	BLOWER‡			MAX. FUEL RATE				Height	Length	Width
				Normal cfm 135° Dischg. Temp.	Assumed External Static In. Water	Motor hp	Oil gph	1000 Btu Gas cfh	LP Gas gph	Coal Lbs. per Hr	in.	in.	in.
H Series Oil & Gas Fired for Large Residences, Small Churches, Schools, Etc.													
H200	200,000	100	2000	2600	½	½	1.8	250	2.5		52	75	41
H250	250,000	125	2000	3300	½	¾	2.2	312	3.1		57	85	41
H300	300,000	136	2200	4000	½	¾	2.7	375	3.8		61	87	50
H350	350,000	152	2300	4600	½	1	3.1	437	4.4		61	87	50
H400	400,000	167	2400	5300	½	1½	3.6	500	5.0		61	87	50
H500	500,000	200	2500	6600	½	1½	4.5	625	6.3		74	91	60
H600	600,000	240	2500	8000	½	2	5.4	750	7.5		76	97	60
H700	700,000	280	2500	9200	½	2	6.3	875	8.8		72	104	80
8000 Series Oil, Gas, Stoker or Hand Fired for Large Schools, Churches, Etc.													
8075	840,000	280	3000	11,000	¾	3	7.5	1050	10.5	100	93	134	76
8100	960,000	320	3000	12,500	¾	3	8.6	1200	12.0	114	95	153	76
8125	1,080,000	360	3000	14,100	¾	3	9.7	1350	13.5	129	97	171	76
8150	1,320,000	440	3000	17,300	¾	5	11.8	1650	16.5	157	98	195	76
8175	1,440,000	480	3000	18,900	¾	5	12.9	1800	18.0	171	99	202	76
8200	1,800,000	600	3000	23,600	¾	5	16.1	2250	22.5	214	120	216	94
8250	2,250,000	750	3000	29,500	¾	7½	20.1	2810	28.0	268	120	243	94
8300	2,700,000	900	3000	35,400	¾	7½	24.1	3380	33.8	320	132	251	104
8350	3,150,000	1050	3000	41,300	¾	10	26.1	3940	39.4	375	150	251	114
Half Series Stoker or Hand Fired for Small Churches, Schools, Stores, Etc.													
930½	310,000	104	3000	4050	½	1				37	60	72	92
936½	363,000	121	3000	4750	½	1½				43	60	78	92
940½	399,000	133	3000	5200	½	1½				48	60	82	92
944½	435,000	145	3000	5700	½	1½				52	60	86	92
948½	486,000	162	3000	6350	½	1½				58	60	90	92
Rectangular Tube Radiator													
9445	537,000	179	3000	7000	½	2				64	60	92	92
9485	550,000	183	3000	7200	½	2				66	60	96	92
8000 Series Unit Heater—Oil, Gas, Stoker or Hand Fired—for Large Industrial Buildings													
U8075	840,000	280	3000	11,000	Consult our Engineers if duct system is to be used.	2-¾	7.5	1050	10.5	100	93	80	76
U8100	960,000	320	3000	12,500		2-¾	8.6	1200	12.0	114	95	93	76
U8125	1,080,000	360	3000	14,100		2-1	9.7	1350	13.5	129	97	105	76
U8150	1,320,000	440	3000	17,300		2-1½	11.8	1650	16.5	157	98	118	76
U8175	1,440,000	480	3000	18,900		2-1½	12.9	1800	18.0	171	99	130	76
U8200	1,800,000	600	3000	23,600		2-2	16.1	2250	22.5	214	120	137	94
U8250	2,250,000	750	3000	29,500		2-3	20.1	2800	28.0	268	120	157	94
U8300	2,700,000	900	3000	35,400		2-3	24.1	3380	33.8	320	132	157	104
U8350	3,150,000	1050	3000	41,300		2-5	26.1	3940	39.4	375	150	157	114

† Based on 80% thermal efficiency for oil and gas and 70% for coal. Add 10% to 35% over calculated heat loss for pick-up load and 10% to 15% for duct radiation losses. The higher figure is preferable for best operating economy and life of the equipment.

‡ For other air volumes and static pressures consult our Engineering Department.

For Complete Specifications, See *Sweet's Catalog Service*

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New Thermo Vector painted to simulate wood paneling in office of Mathias Klein, President, Mathias Klein & Sons, Chicago, Ill.

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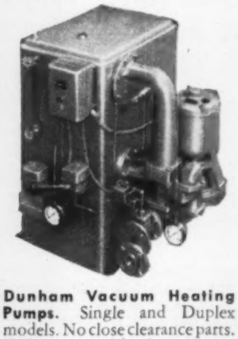
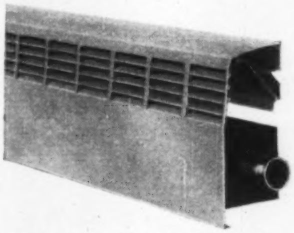
you can DEPEND ON DUNHAM for
everything you need in heating

Dunham Radiator Valves. Complete line of radiator valves, traps and other specialties for steam heating.



Dunham Vacuum Heating Pumps. Single and Duplex models. No close clearance parts. Only one moving element.

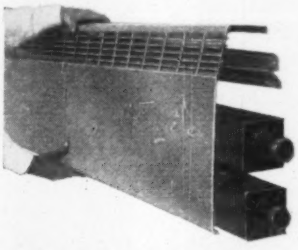
Vector along-the-wall radiation



Here you see the tailored, trim lines of new Thermo Vector.

—with a tailored, trim look

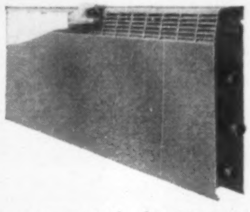
New Dunham Thermo Vector looks good ANYWHERE! Its smooth, unbroken horizontal lines blend beautifully in any office or commercial building . . . and Thermo Vector is sturdy enough to stand up for years and still look good in any industrial or institutional installation.



Here you see how easily new Thermo Vector is installed using "hanging strip."

—with "built-in" versatility

New Dunham Thermo Vector is used flush mounted along the walls . . . one, two or three tiers high . . . with steam or hot water . . . steel or nonferrous elements. Use with full back or just use "hanging strip." Front outlet grille eliminates wall smudging—lets you install Thermo Vector ANYWHERE.



Here you see the lever-operated damper installed in three tier Thermo Vector.

—with cost-cutting ease of installation

To install Dunham Thermo Vector, all you do is position the back or "hanging strip" on wall. Attach element support to it and hang elements. Mount one-piece cabinet . . . then accessories which conceal elements and piping for the "finishing touches." Fronts, backs and lever-operated damper easily cut on the job.

For further information, write for Bulletin HPAC-1, C. A. Dunham Company, 400 W. Madison St., Chicago 6, Ill.

DUNHAM®

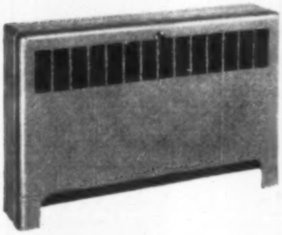
THERMO VECTOR RADIATION

TRADE-MARK

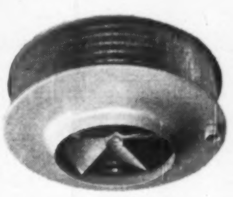
RADIATION • CONTROLS • UNIT HEATERS • PUMPS • SPECIALTIES

Quality First for Fifty-One Years

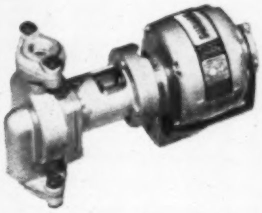
C. A. DUNHAM COMPANY • CHICAGO • TORONTO • LONDON



Dunham Radiation. Full range of sizes and types of convectors, baseboard and finned tube radiation.



Dunham Unit Heaters. Line includes heating-cooling units, vertical, horizontal discharge and large blower unit heaters.



Dunham Circulators. Heart of Dunham's complete hot water line. Single-spring motor coupling. Brand-name motor.

DUNHAM
RS1-B CONTROL PANEL

Dunham Vari-Vac®. Precision temperature control system uses continuous-flow "cool" steam, cuts fuel costs up to 40%.

From New York to Buffalo ...it's Sarcotherm at every point

BUFFALO
Rochester
Syracuse
Utica
Albany
427 MILE NEW YORK STATE THRUWAY
NEW YORK CITY

At all 40 toll interchanges heating systems controlled by Sarcotherm Weather-Compensated Systems

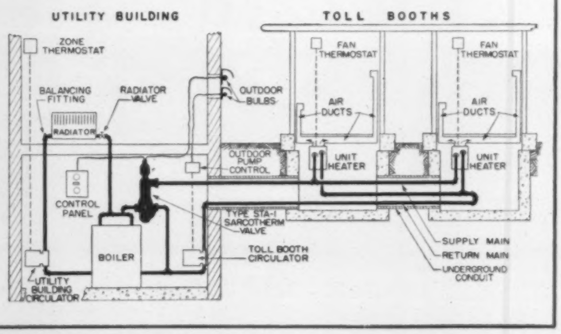
Mechanical Engineers: Syska & Hennessy, Inc., N.Y.C. • Heating Contractor: Mechanical Installations, Inc., L. I. City • Booths by Taller & Cooper, Brooklyn

HERE IN EFFECT is a heating system which stretches from the southeastern to the northwestern extremities of New York State.

It is obvious, therefore, that such a system must be so simple, so fool-proof, so utterly dependable, that any possibility of breakdown or other trouble will be reduced to an absolute minimum.

That is why *reliability* received so much attention from the Thruway's heating engineers. And that is one of the principal reasons why Sarcotherm Weather-Compensated Control Systems are installed in all 40 toll interchanges.

At each toll barrier a Sarcotherm Weather-Compensated Control System, calibrated to the design temperature for the particular locality, automatically proportions supply water to unit heaters in individual booths. Room thermostats control fan motors.


UTILITY BUILDING
TOLL BOOTHS
ZONE THERMOSTAT
BALANCING FITTING
RADIATOR VALVE
RADIATOR
OUTDOOR BULBS
FAN THERMOSTAT
AIR DUCTS
UNIT HEATER
FAN THERMOSTAT
AIR DUCTS
UNIT HEATER
OUTDOOR PUMP CONTROL
CONTROL PANEL
TYPE STA-1 SARCOTHERM VALVE
BOILER
TOLL BOOTH CIRCULATOR
UTILITY BUILDING CIRCULATOR
SUPPLY MAIN
RETURN MAIN
UNDERGROUND CONDUIT

Advantages of Sarcotherm Systems

Easy to install — tailor-made drawings and diagrams of the complete system are furnished for each job.

Easy to maintain — by regular maintenance men, because of simplicity; fewer parts, such as transformers, relays.

Easy to adjust — to any desired setting.

Complete control system — including all specialties such as radiator valves, balancing fittings — all from one manufacturer, Sarcotherm. Unit responsibility.

On the job assistance — to contractors from Sarcotherm's field engineers.

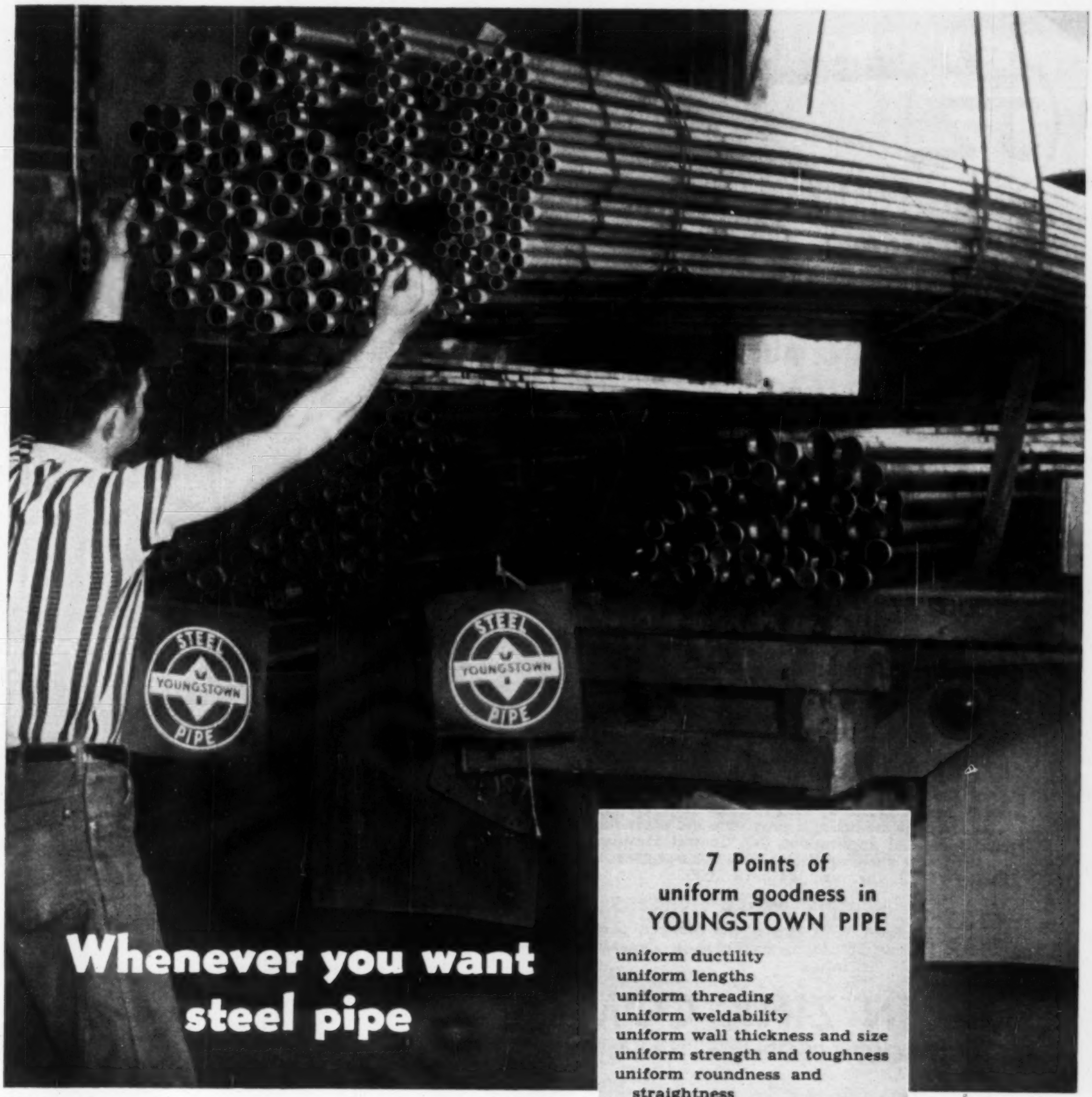
SARCOTHERM CONTROLS, Inc.

Empire State Bldg., New York 1, N. Y.

An affiliate of Sarco Company, Inc.

4002-C

Weather-Compensated Control Systems for **HOT WATER, RADIANT AND STEAM** *Heating*



7 Points of uniform goodness in YOUNGSTOWN PIPE

uniform ductility
uniform lengths
uniform threading
uniform weldability
uniform wall thickness and size
uniform strength and toughness
uniform roundness and straightness

● Made of finest quality steel, with close attention to size, threading and finish — that's Youngstown! You can't buy better pipe anywhere.

And your Youngstown Distributor is there to serve you. He has a big stock of this good pipe in all wanted sizes, close at hand and ready to deliver promptly. Why not phone him whenever you need pipe?

Youngstown

QUALITY
YOUNGSTOWN
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THE YOUNGSTOWN SHEET AND TUBE COMPANY *Manufacturers of Carbon, Alloy and Yoloy Steel*

General Offices: Youngstown, Ohio - District Sales Offices in Principal Cities

SHEETS - STRIP - PLATES - STANDARD PIPE - LINE PIPE - OIL COUNTRY TUBULAR GOODS - CONDUIT AND EMT - MECHANICAL TUBING - COLD FINISHED BARS - HOT ROLLED BARS - BAR SHAPES - WIRE - HOT ROLLED RODS - COKE TIN PLATE - ELECTROLYTIC TIN PLATE - RAILROAD TRACK SPIKES

WARMS AIR — DRIES AIR

J-Z JOHN ZINK

JOHN ZINK Heaters for Every Use

FOR HOME AND BUSINESS
SPECIFY SAFE, AUTOMATIC J-Z HEATERS

There are four styles of J-Z Heaters to meet every domestic and industrial heating requirement. J-Z Heaters provide many advanced engineering features that assure safe, economical operation and maximum heat output. Whether bought for home or commercial use, J-Z Heaters and Burners are AGA approved for natural, mixed or LP Gas.

FLOOR FURNACES

J-Z Gas Fired FLOOR FURNACES are available in five conventional and short models with input ratings from 30,000 B.T.U./hr. They become a complete one-package heating unit when equipped with safety pilot and automatic temperature control. Small grille, high heat transfer.

SUSPENDED UNIT HEATERS

Series UHS Fan Type UNIT HEATERS are fully automatic and provide clean, safe and trouble free forced air heating. Heaters are for all gases and are equipped with positive automatic safety shut-off valves. Have B.T.U./hr. rating from 55,000.

CENTRAL GAS HEATERS

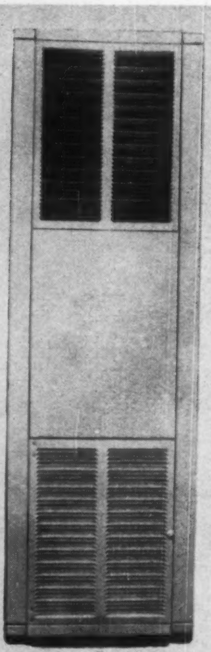
J-Z CENTRAL HEATING UNITS are compactly built, simple, efficient in operation and are available in Vertical or Horizontal type forced air models. Heaters can be installed in the basement, attic, service closet or utility room. The AF-110 may even be installed under the house if provisions are made for the draft diverter. For industrial applications, J-Z Central Heating Units can be installed on a shelf or balcony, as a suspended heater or as a duct heater. B.T.U./hr. ratings from 65,000.

WALL HEATERS

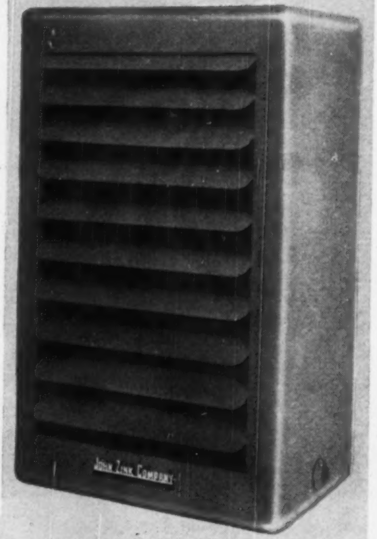
WH-25 Recessed Wall Heater fits between partitions on 16" stud centers. Barely 58" high. Available in standard or radiant styles. 25,000 B.T.U./hr. rating.

JOHN ZINK COMPANY

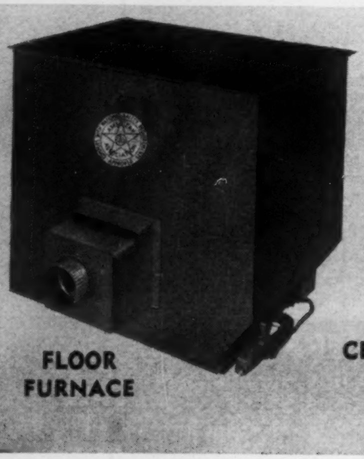
4401 SOUTH PEORIA • TULSA, OKLAHOMA



WALL HEATER

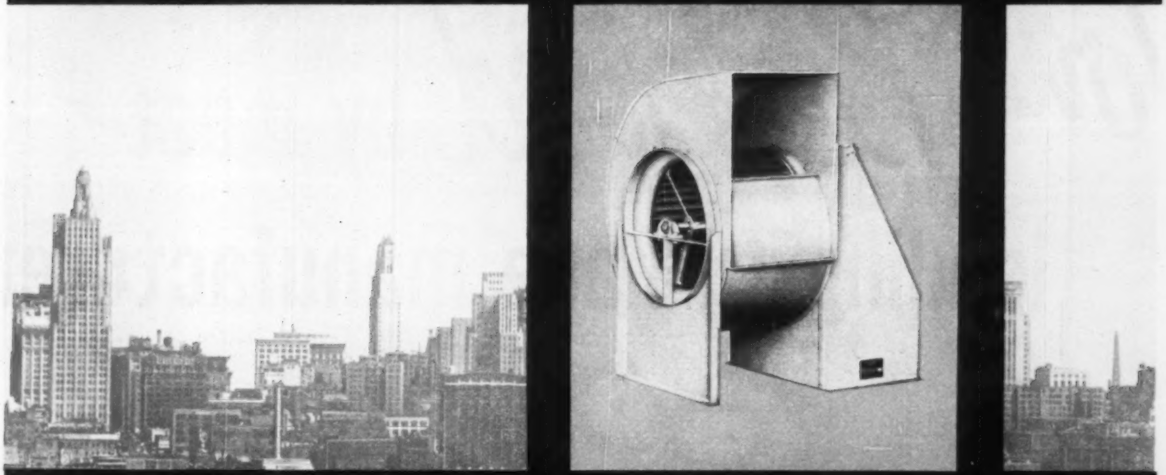


SUSPENDED UNIT HEATER



FLOOR FURNACE

CENTRAL GAS HEATER



"THE FORGOTTEN FAN"

Because the fan on the roof often becomes "the forgotten fan," it frequently breaks down from exposure to wind and weather and from lubrication neglect.

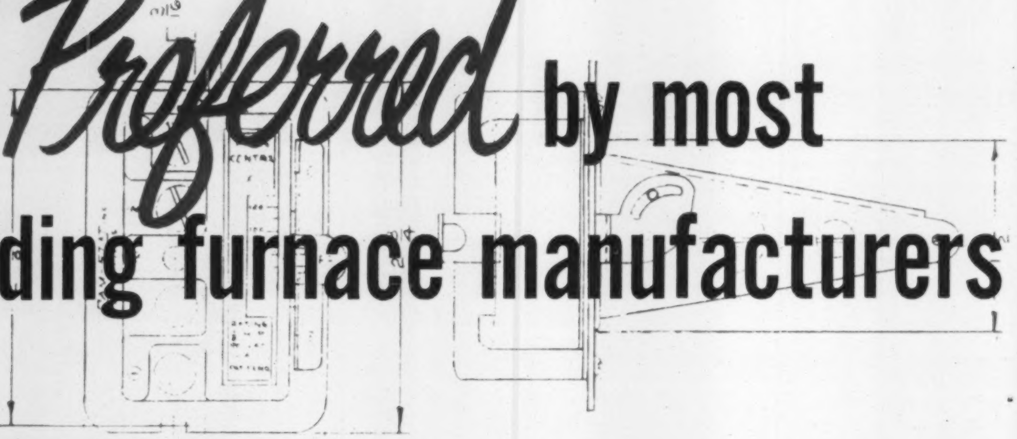
With a weather eye toward this fact, Utility has designed a full series of precision-engineered blowers with permanently sealed, pre-greased ball bearings. They require no further greasing, and can't break down from lubrication neglect.

What's more, motors and drives are completely enclosed—making them forever impervious to dirt, dust, moisture and drastic temperature changes.

Manufacturers of heavy and standard duty blowers for heating, air conditioning and ventilating installations. Producers of blowers and blower parts for original equipment manufacturers. Write for catalogue data.

UTILITY FAN CORPORATION
911 East 59th Street, Los Angeles 1, California

A Division
of Utility
Appliance Corp.



Now! Preferred by most leading furnace manufacturers

Here Are The Reasons:

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2. SIXTY DIFFERENT COMBINATIONS
3. AVAILABLE FOR INTEGRAL OR PLENUM MOUNTINGS
4. WITH OR WITHOUT CONDUIT HOUSINGS
5. INDIVIDUAL CONTROLS OR IN COMBINATION
6. WIDE VARIETY OF SETTINGS AND DIFFERENTIALS, BOTH FIXED & ADJUSTABLE
7. AVAILABLE WITH 7″ OR 3″ BIMETAL ELEMENT EXTENSION
8. PRECISION CALIBRATIONS AND DIFFERENTIALS —ACCURATELY MAINTAINED
9. HIGH RATING—½ HORSEPOWER AND 90 VOLT AMPERES
   OR
   FOR MILLIVOLT CIRCUITS—HIGH CONTACT PRESSURE, DUAL CIRCUIT
10. EXTREME SENSITIVITY
11. SNAP ACTION SWITCH—CLEAN MAKE & BREAK
12. HIGHEST QUALITY
13. LISTED BY UNDERWRITERS' LABORATORIES, INC.

and

14. CANADIAN STANDARDS ASSOCIATION

Complete application testing available to furnace manufacturers, without obligation

Complete flexibility with highest quality

FAN CONTROL
120
100
80
OFF
MODEL F14-11A
RATING 1/2 HP AT 120 OR 240 V.A.C.
PAT. PEND.
CAM-STAT
LIMIT CONTROL
120
140
160
180
200
OFF
MODEL L22-8A
TO REMOVE COVER
PUSH LEVER
TO LOCK COVER
CAM-STAT
COMBINATION
FAN AND LIMIT CONTROL
MODEL
HOUSING-H39
CAM-STAT INCORPORATED
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INDIVIDUAL FAN CONTROL

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WATERLOO

Air Diffusion Equipment

is consistently specified by leading Architects, Engineers and Contractors for many of the Nation's finest

- ★ **CHURCHES — SCHOOLS**
- ★ **HOSPITALS — MEDICAL CENTERS**
- ★ **GOVERNMENT BUILDINGS**
- ★ **INDUSTRIAL BUILDINGS**
- ★ **HOTELS — APARTMENTS**
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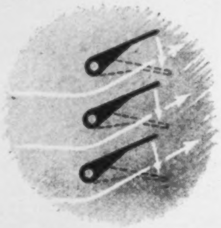
Why?

Because these specialists demand the finest — Grilles and Registers that are *tops* in appearance, *low* in decibel rating.

WATERLOO meets these exacting requirements with its sleek, custom-finished one piece appearance, with bevelled edge frame that adds to interior beauty

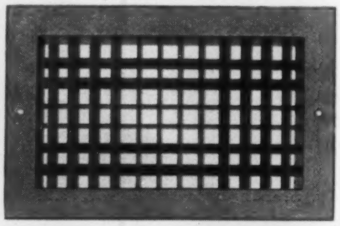
and its EXCLUSIVE



SILENT FLOW TEAR DROP LOUVRE DESIGN

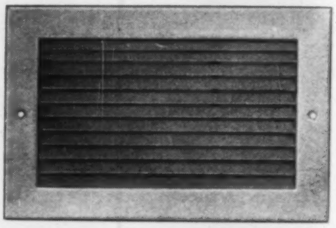
Providing unobtrusive diffusion with *sufficient surface* to turn high velocity air without turbulence.

Select your requirements from these and other models



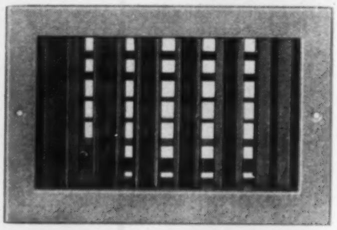
2V SUPPLY GRILLE

For long or short throw. Each blade individually adjustable for 4-way deflection at degree desired.



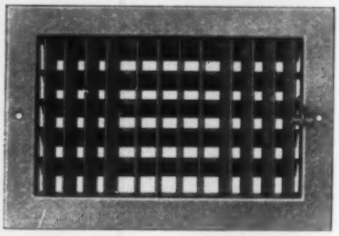
3H RETURN AIR GRILLE

Fins spaced on ¾ in. centers for fixed directional supply or return at 45° or 0° deflection.



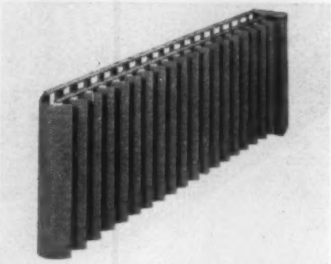
2VO SUPPLY REGISTER

Fins spaced on ¾" centers. 2 sets adjustable louvres, vertical and horizontal with opposed damper, vertical blades.



IVMH SUPPLY REGISTER

Fins spaced on ¾" centers; One set adjustable vertical louvres, multi - shutter damper, horizontal blades.



DUCTROL

Volume controller and extractor adjustable from full open to full closed. Assures even distribution to entire grille face.

Write for complete catalog or for the name of your local WATERLOO Representative

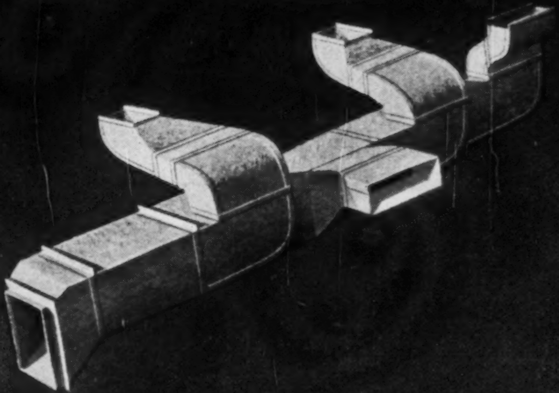
Since 1902

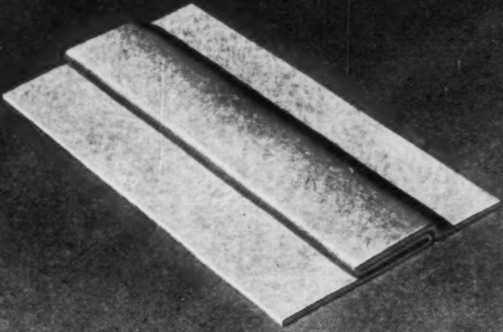
WATERLOO REGISTER CO., INC.

P. O. BOX 72 Waterloo, Iowa, U.S.A.

BEST CHOICE

for all your sheet metal work





WEIRTON GALVANIZED STEEL

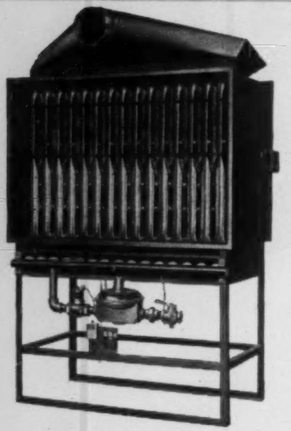
For gutters, downspouts, air conditioning and furnace ducts, and other applications requiring a durable zinc-coated material, there's no better choice than Weirton galvanized steel—for several reasons.

Weirton galvanized steel has special qualities that stand out over the long run: A tight zinc coating that resists cracking, peeling and flaking . . . better resistance to corrosion . . . exceptional durability—all assured by Weirton's modern plant and processes, and by close control through the entire production cycle.

Next time you place an order for galvanized steel, call Weirton. Chances are we can help to make yours a better product.

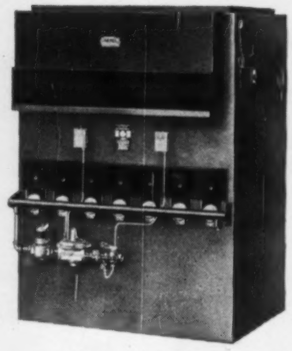
WEIRTON STEEL COMPANY
Weirton, West Virginia

NATIONAL STEEL CORPORATION



MODEL SED-E

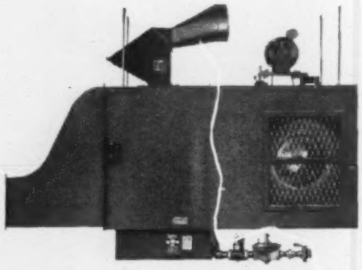
MODEL SED-S



MODEL SED-VF

MODEL SED-E — Non-corrosive type 321 stainless steel heat exchanger. Permits installation downstream of cooling equipment, for continuous blower operation. Air throughput in either direction. 80,000 to 600,000 Btu input.

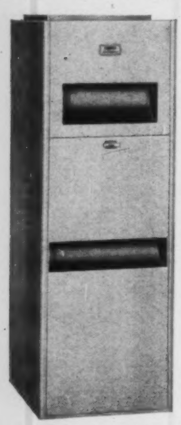
MODEL SED-S — Same as SED-E except controls are at the side, instead of at the end where accessibility requires either SED-E or SED-S is available in sizes from 80,000 to 600,000 Btu input in increments of 40,000 Btu.



MODEL SEU

MODEL SED-VF — Tested and approved as a duct furnace; type 321 stainless steel. Re-circulated or fresh air enters through bottom, sides, or back. Built in air bypass, vent in front. Sizes from 70,000 to 245,000 Btu input.

MODEL SEU — Suspended unit heater. Recirculates room air. Diffuser outlet with adjustable vertical and horizontal vanes. Double inlet forward curve blower. Continuous duty variable pitch drives, raised port burners.



MODEL SEC

HAYES

FURNACES

outstanding for
commercial, industrial,
schools, churches,
theaters, large residential

HAYES FURNACE MFG. & SUPPLY CO.
2929 So. Fairfax Ave., Los Angeles 16, California
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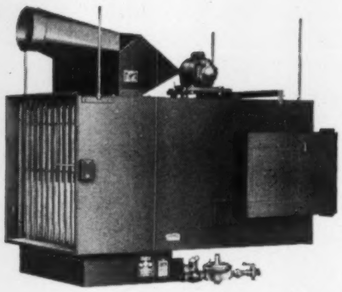

MODEL SES

MODEL SEC — Forced air furnace. Stainless steel heat exchanger sections seam and arc welded. One piece cast iron burners with drilled ports. Oversize double inlet blower glass or washable filters. 6 sizes — 70,000 to 245,000 Btu input.

REPRESENTATIVES

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Blue Flame Supply Company, Atlanta, Georgia.
Eugene Bolstad, Edmonton, Alberta, Canada.
E. B. Bomar, Phoenix, Arizona.
Boyd Engineering Co., Albuquerque, New Mexico And El Paso, Texas.
Reube O. Emery, Nashville, Tennessee.
Leudecke Engineering Co. Austin. Texas.
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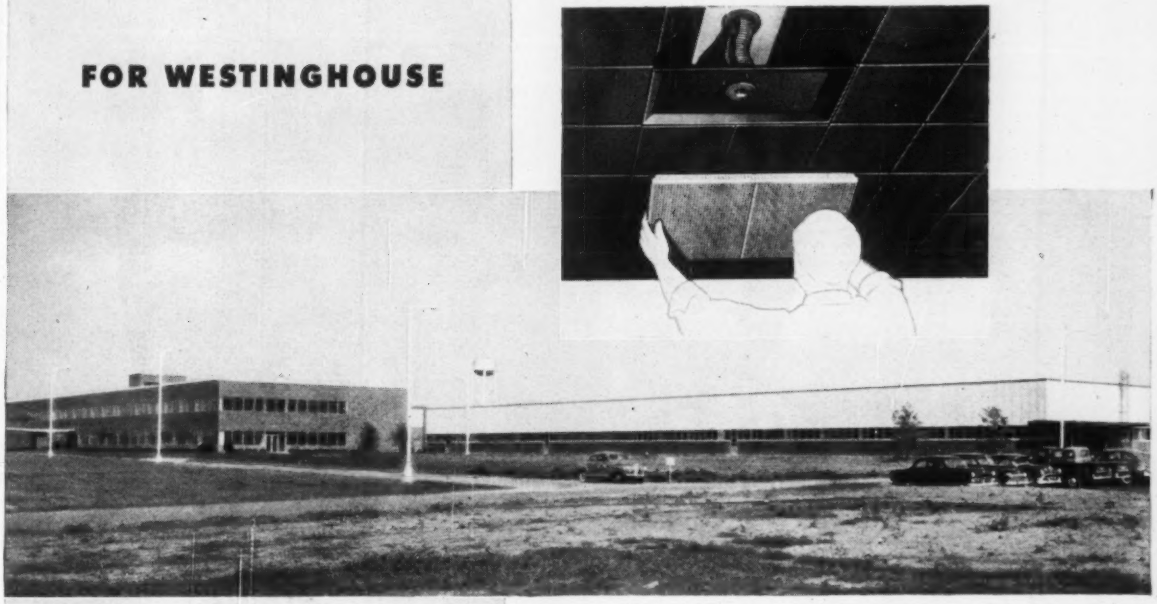
O'Connor-Oklahoma Co., Oklahoma City and Tulsa, Oklahoma.
Smith Steam Specialty Co., Kansas City, Mo.
Tay-Holbrook, Inc., San Francisco, California.
F. R. Young, Houston, Texas.
Associated Refrigeration Engineers, Montgomery, Alabama.
Dealers Supply Company, Atlanta, Georgia.
Jewell & Company, Hot Springs, Arkansas.
Homer Maxey & Company, Lubbock, Texas.
Noland & Co., Newport News, Va.

MODEL SES—Forced air, suspended furnace for installation in suspended duct system. Inlet and outlet designed for sheet metal duct connection. Double inlet forward curved blower. Continuous duty variable pitch drives, raised port burners.

IDEAL "INDOOR WEATHER"
WITH... multi-vent

LOW VELOCITY AIR DIFFUSERS

FOR WESTINGHOUSE



Westinghouse Meter Division Plant, Raleigh, N. C. Robert and Company Associates, Atlanta, architects and engineers.

Partial list of prominent companies which have recently installed Multi-Vent in offices, plants and laboratories.

- Boeing Airplane Co.
- Cincinnati Gas & Power
- Dow Chemical Co.
- I. E. DuPont DeNemours & Co.
- Ford Motor Co.
- General Telephone Co.
- H. J. Heinz Co.
- International Harvester
- Eli Lilly & Co.
- Mead Johnson & Co.
- Ohio Oil Co.
- Pittsburgh Plate Glass
- Rand McNally & Co.
- Sawyer Biscuit Co.
- G. D. Searle Co.
- Sharp and Dohme
- Southern California Gas
- Standard Oil of Indiana
- U. S. Steel Corp.
- Yale & Towne

FOR GENERAL OFFICES—LABORATORIES ENGINEERING DEPARTMENTS—TEST ROOMS

As in the Westinghouse plant, illustrated above, and in other industrial plants, Multi-Vent is specified where true air conditioned comfort or accurate control of air movement, temperature and humidity is demanded.

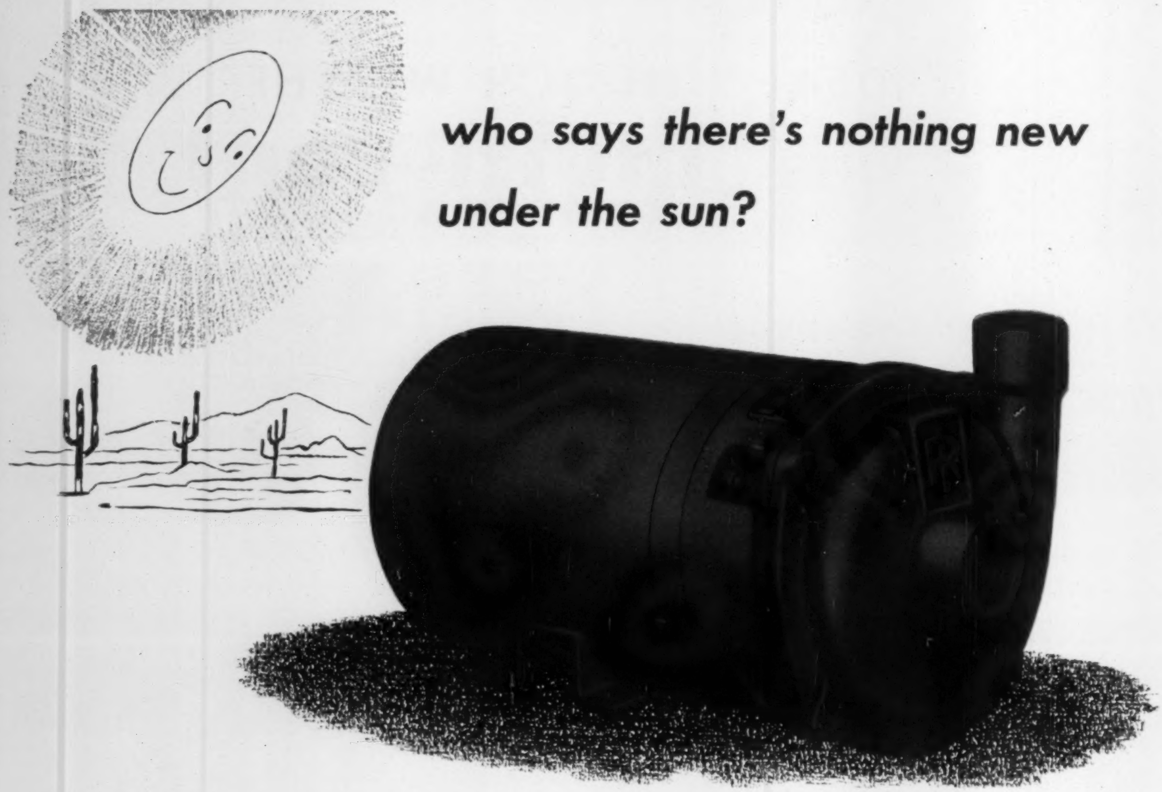
Because Multi-Vent is designed and engineered for easy installation and to handle high loads and high ventilating requirements, with a uniform low rate of room-air motion, it meets the most exacting demands of industrial processing and scientific research.

Flush or completely concealed in the ceiling, Multi-Vent distributes air at low-velocities by gentle pressure displacement, thus providing a degree of air conditioned comfort unmatched by any other diffuser. Write for detailed literature.

THE PYLE-NATIONAL COMPANY
1373 North Kostner Avenue, Chicago 51, Illinois

MULTI-VENT DIVISION
Sales and Engineering Representatives in Principal Cities of United States and Canada

who says there's nothing new under the sun?



here's Ingersoll-Rand's NEW Motorpump

for air-conditioning service

And it's under the hot weather sun your customers will thank you for installing an Ingersoll-Rand Motorpump on their air conditioning system. Especially this new Motorpump, which is a leader in performance, size and weight. Furthermore, additional features in shaft sealing, impeller attachment and fool-proof start-up measures will mean less trouble for your customers. And, in addition to this, the new Motorpump is priced competitively.

The long, trouble-free operation record of Motorpumps speaks for itself, and comes from our quarter-century of designing and building pumps for this particular service.

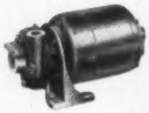
Why don't you investigate today? Contact your nearest Ingersoll-Rand branch office or write for complete details about the pump that's conditioned for air conditioning.

The most complete pump line for air conditioning service.

The MOTOR IR PUMP Line

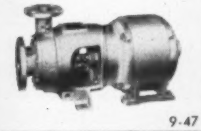
⅓ to 1 hp

⅓ to 1½ hp



1 to 7½ hp

1 to 75 hp

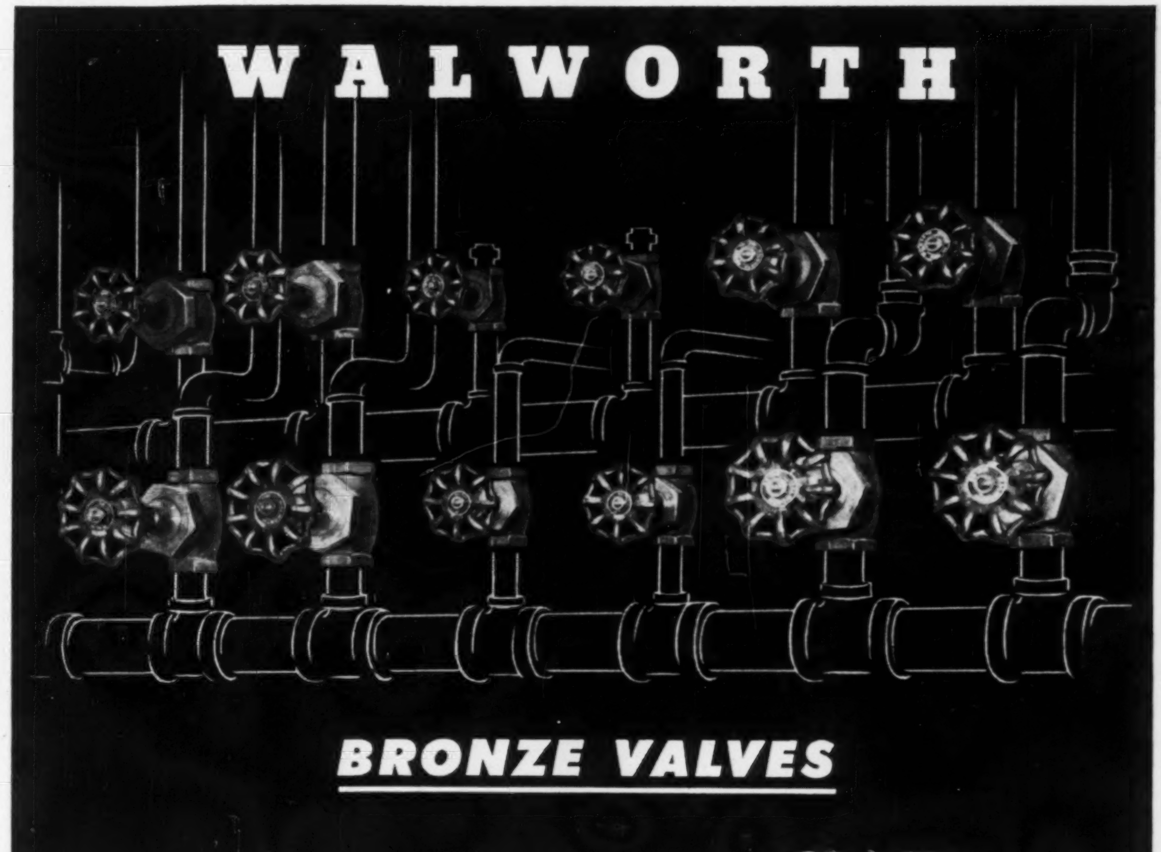


9-47

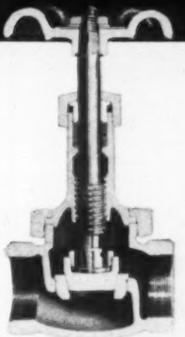
Ingersoll-Rand

Cameron Pump Division
11 Broadway, New York 4, N. Y.

WALWORTH



BRONZE VALVES



Better because ... **Walworth has standardized its line of bronze valves to provide an unsurpassed system of interchangeability of parts for assembly or replacement. You can maintain a great number of Walworth Bronze Valves with a small inventory of basic parts . . . you minimize part replacement problems. For further information, ask us for our Bronze Valve Standardization Chart.**

Parts are carefully machined and finished to close tolerances, thereby assuring accurate fit and alignment under all conditions. Sectioned valve is Walworth No. 225P Bronze Globe Valve with stainless steel plug-type seat and disc, heat-treated to a minimum of 500 Brinell hardness.

Choose from complete lines of Walworth Bronze Valves – including gate, globe, angle, check, and lubricated plug types. Walseal® Bronze Valves and Fittings are also available for making silver-brazed joints.

For full information on Walworth Bronze Valves and Fittings, call your Walworth Distributor, nearest Walworth Sales Office, or write to Walworth Company, General Offices, 60 East 42nd Street, New York 17, N. Y.

WALWORTH
Manufacturers since 1842
valves . . . pipe fittings . . . pipe wrenches
60 East 42nd Street, New York 17, N. Y.

DISTRIBUTORS IN PRINCIPAL CENTERS THROUGHOUT THE WORLD

H.B. Smith World's Broadest Line of Cast Iron Boilers for Heating and Domestic Hot Water . . .

EASIEST TO INSTALL

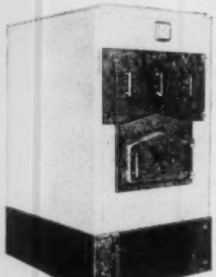
Because H. B. Smith cast iron boilers are assembled from precision-machined sections and parts, they are easily erected at the installation with a minimum of labor. Can be erected on location at any stage in building.

EASIEST TO EXPAND

When increasing the capacity of an H. B. Smith boiler to meet additional heating requirements, or when replacing it, it is not necessary to tear out a wall, part of a foundation, or both. In Header-type Series 24 — 34 — 44 and 42 and 60 Boilers, a damaged section can be cut out of the line without delay or extensive repairs.

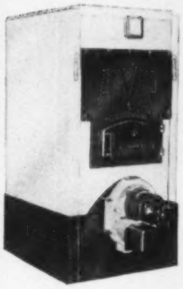
EASIEST TO CONVERT

H. B. Smith boilers are easiest to convert to different fuels, should the one in use become in critical supply. All operate with great efficiency with solid fuel, oil or gas. In low-cost natural gas areas, H. B. Smith boiler conversions are bringing clean, trouble-free, inexpensive heat to hundreds of users.



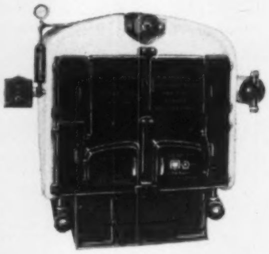
Series 15, 20, 25 Boilers for Homes, Small Commercial Buildings

Here's a complete series of modern push nipple boilers available in models for oil, gas, coal stoker or hand firing, with provision for built-in domestic water heaters and controls. Capacities of 200 sq. ft. to 2275 sq. ft. steam radiation.



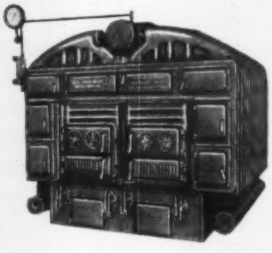
Series 100 — 2000 Boiler-Burner Units for Homes, Small Buildings

Compact, easy to install: Designed to give fast heat and plenty of hot water for the average home. Furnished with built-in tank type or "tankless" water heater; available with flush jacket as shown, or with jacket expanded to conceal the oil burner.



Series 24, 34, 44 Mills Boilers for Schools, Apartment Buildings

Capacities of 900 sq. ft. to 13,380 sq. ft. steam radiation. Independent header-type construction; there are tens of thousands of famous Mills boilers in schools, hospitals, apartment houses, stores and other commercial and public buildings. Models for hand and all types of automatic firing.



Series 42 and 60 Smith Boilers for Larger Installations

May be used singly, or in batteries for heating loads up to and over 100,000 sq. ft. steam radiation. Many of these large units installed in industrial plants furnish steam for process requirements as well as for heating and domestic hot water. Have header-type construction permitting the cutting off of one or more sections in emergency without serious shutdown.

Hy-Tests for Domestic Hot Water

Series 17, 24, 34 and 44 hot water supply units are used in connection with the larger type heating installations, such as apartment houses, factories, public buildings, etc. They are all readily convertible from one fuel to another and work equally well with oil, coal or gas.

H. B. Smith CAST IRON BOILERS

THE H. B. SMITH CO., INC., WESTFIELD, MASS.

J. F. Pritchard & Co. of California Announces the All-New LoLine Cooling Tower

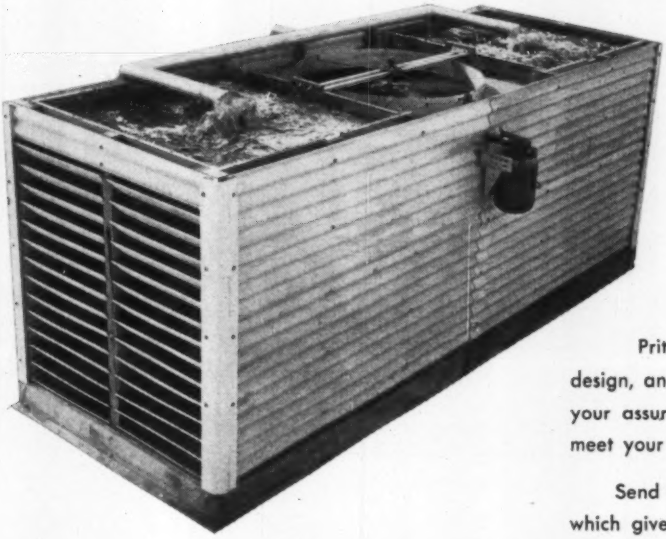
LOWEST SILHOUETTE TOWER OF 75 TON CAPACITY AND UP NOW AVAILABLE—SPECIFICALLY DESIGNED FOR AIR CONDITIONING APPLICATIONS

LoLine

Reg. U. S. Pat. Off. Pending.

Here's the LoLine, an all-new cooling tower for air conditioning applications — *with the lowest silhouette of any tower of 75 ton capacity or larger.*

Pritchard's new LoLine incorporates many features in its design which are unique in cooling tower construction. Here are a few:



- **Lowest silhouette**
- **Guaranteed performance**
- **75 ton capacity and up**
- **Attractive exterior**
- **Rugged construction**
- **Special water piping arrangement**
- **Easy to install**
- **Easy maintenance**

Pritchard's many years of experience in the research, design, and construction of cooling towers for all industry is your assurance that the LoLine is a quality tower that will meet your performance requirements.

Send the coupon below for your copy of a new catalog which gives complete details on the LoLine — the tower designed and built by Pritchard, a founder member of the Cooling Tower Institute.

INDUSTRY'S PARTNER FOR PROGRESS

COOLING TOWERS
AIR COOLED HEAT EXCHANGERS
GAS & AIR TREATING EQUIPMENT

REPRESENTATIVES
IN PRINCIPAL CITIES
FROM COAST
TO COAST

J.F. Pritchard & Co.
OF CALIFORNIA
A DIVISION OF J. F. PRITCHARD & CO
4625 Roanoke Parkway, Kansas City 12, Mo.

Mail This Coupon For Your Copy of The New LoLine Catalog

Name	
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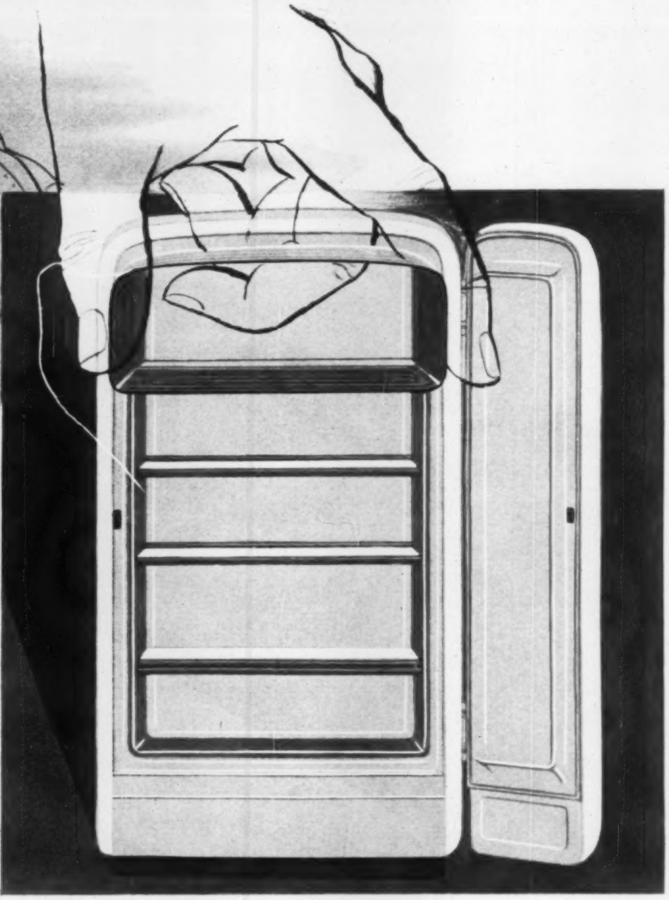
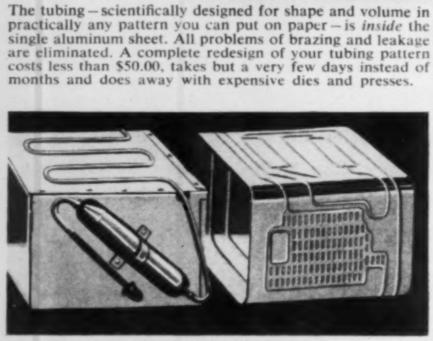
WESTERN Roll-Bond PROCESS

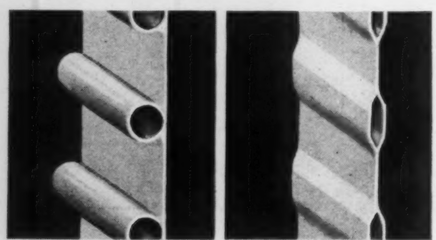
offers the greatest advance in Refrigeration since the Drip Pan left the kitchen!



The tubing—scientifically designed for shape and volume in practically any pattern you can put on paper—is *inside* the single aluminum sheet. All problems of brazing and leakage are eliminated. A complete redesign of your tubing pattern costs less than $50.00, takes but a very few days instead of months and does away with expensive dies and presses.



All other evaporators require separate accumulators which must be produced and attached at additional cost. They must be brazed into the system and need at least two joints. With the new Western Roll Bond Process, the waffle pattern accumulator illustrated is part of the plate and is furnished at *no* extra cost. Leakage and brazing are eliminated.



For automatic defrosting, the surface of a Western Roll Bond evaporator is entirely free of voids and pockets. This eliminates any possibility of moisture collecting and causing "frost blisters" that separate the tubing from the wall.

Right now, evaporators made by the new Western Roll Bond Patented Process are being used by one of America's leading refrigerator manufacturers. Already, in over 300,000 homes, the Western Roll Bond evaporator is proving its superiority over the old-fashioned brazed tube type. The Western Roll Bond evaporator transfers heat so efficiently that a substantial reduction in the amount of refrigerant used is possible.

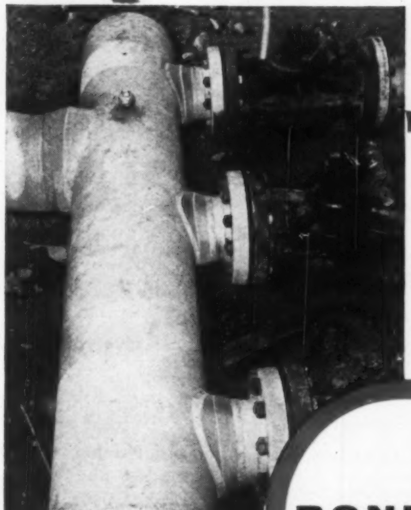
So revolutionary is this process that wherever your operations now call for heat exchangers of any type or for any purpose, Western Roll Bond offers a more efficient, a more economical answer. This completely new era of refrigeration design already is an assembly line reality. *Now* is the time to begin a serious investigation of what this Western Roll Bond Process can offer your own firm. Your inquiries are invited.

WESTERN Roll-Bond
a product of
metals division
OLIN MATHIESON CHEMICAL CORPORATION
Plants • East Alton, Ill.—New Haven, Conn.

YES—1955 is the year of sharp pencils

FOR REAL SAVINGS IN WELDED BRANCH FITTINGS SHARP PENCILS SPELL . . .

WELDOLETS



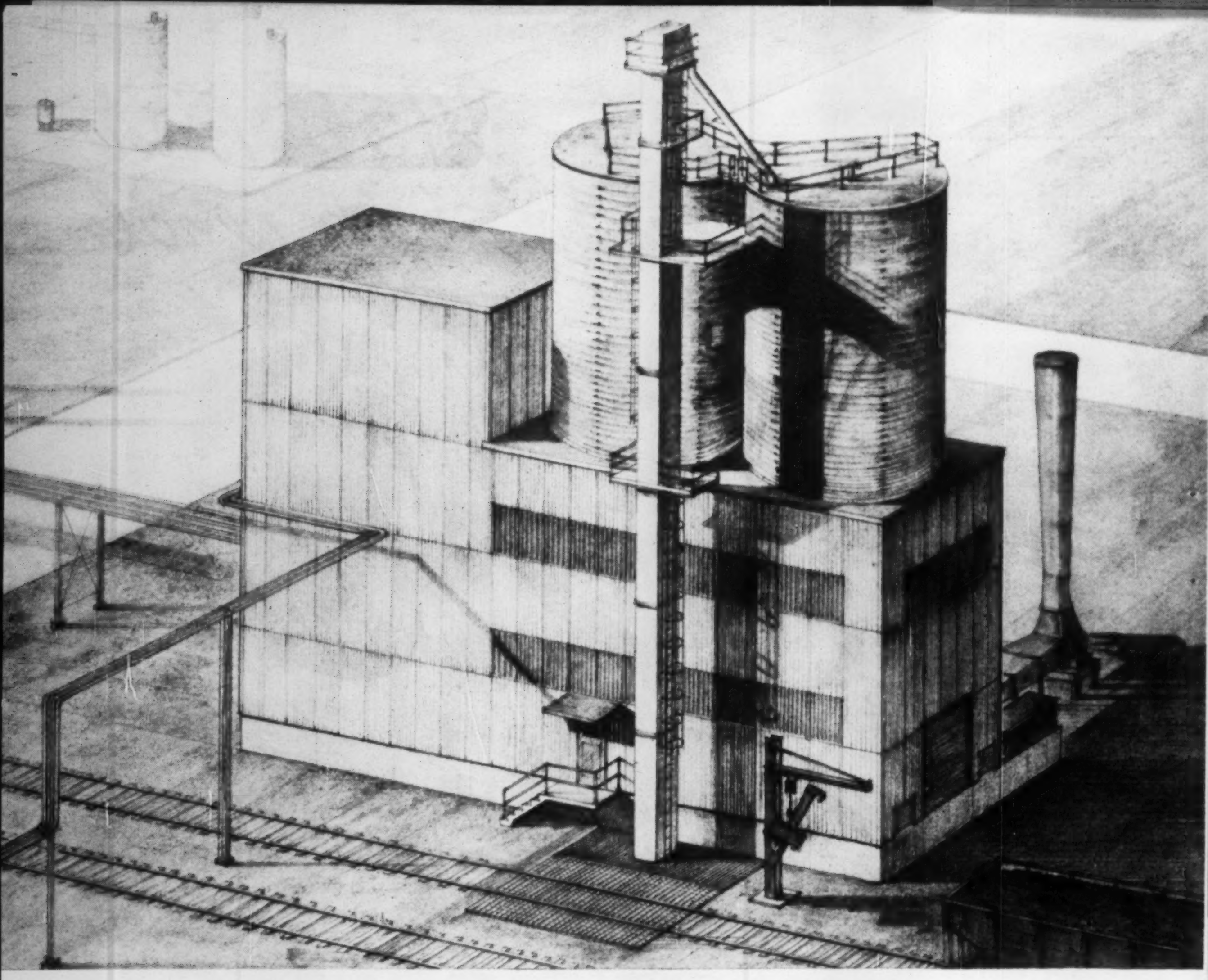
$700 was saved because Weldolets were used on the welded header shown at left. (Actual on-the-job photo.)

Weldolets are available in all principal cities from selective warehousing distributors.

WELDING FITTINGS DIVISION

BONNEY FORGE & TOOL WORKS

715 MEADOW ST., ALLENTOWN, PENNA.



Stauffer Chemical's New Petrochemical Plant Burns Coal the Modern Way

When Stauffer Chemical Co. constructed a multi-million dollar Petrochemical plant in Louisville, Kentucky, the Process Engineering firm of Singmaster & Breyer specified and built a modern coal burning boiler plant (shown above)—incorporating a fully automatic combustion system, completely up-to-date coal and ash handling equipment.

The results? Fuel and labor costs are at a minimum. Dust concentration is well within the limit fixed by the Louisville Air Pollution Control Commission. Initial cost of the plant was $6.38 per pound of steam per hour, compared to an average $8 to $10 for plants the same size. And total cost of steam—including fuel, labor, maintenance, power, and fixed costs—is only 60c per 1000 pounds!

Investigate Your Fuel Costs

If you're planning to modernize your plant or build a new one—or if you are just interested in cutting fuel costs—find out how coal, burned the modern way, compares to other fuels. Talk to a consulting engineer or your nearest coal distributor. Their advice may save you thousands of dollars each year.

facts you should know about coal

In most industrial areas, bituminous coal is the lowest-cost fuel available.

Up-to-date coal burning equipment can give you 10% to 40% more steam per dollar.

Automatic coal and ash handling systems can cut your labor cost to a minimum.

Coal is the safest fuel to store and use. No dust or smoke problems when coal is burned with modern equipment.

Between America's vast coal reserves and mechanized coal production methods, you can count on coal being plentiful and its price remaining stable.

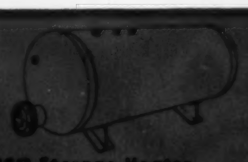
For further information or additional case histories showing how other plants have saved money burning coal, write to the address below.

BITUMINOUS COAL INSTITUTE
A Department of National Coal Association
Southern Building, Washington 5, D.C.

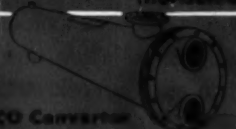
RECO ENGINEERED

For Better Heating Performance

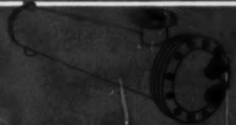
Whatever your heat transfer requirements, you can rely on RECO ENGINEERED heat exchange equipment to meet your maximum specifications for performance, economy and guaranteed dependability. Thousands of installations in our 40 years of operation testify to our skill in research, design and fabrication. We will be happy to give you cost-free the benefits of our experience and make recommendations on your next heating job. Why not write for our heat exchange catalogs and the name of your nearest RECO representative?



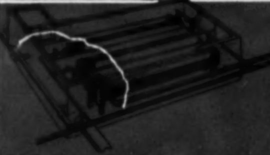
RECO Storage Heater (Horizontal)



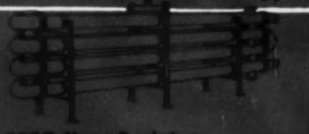
RECO Converter



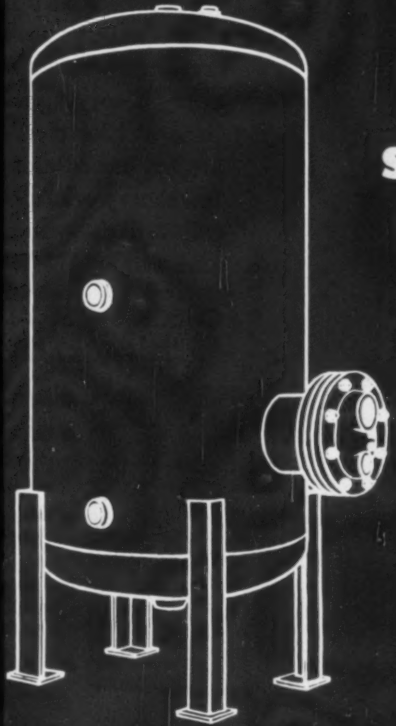
RECO Instantaneous Heater



RECO Heat Reclaimer (Fin Type)



RECO Heat Reclaimer (Closed Type)



RECO
Storage Type HEATERS

Proved over the years, the RECO Storage Heater is an efficient, dependable source of hot water for use where large amounts are needed at irregular intervals. It is available for horizontal or vertical mounting, and can use steam or boiler water as the heating medium. RECO heaters are made of highest quality materials with a wide range of alloys to meet any installation requirement. They are factory tested, guaranteed and fabricated to meet ASME and other Code Specifications when required.

VISIT THE RECO EXHIBIT AT THE 12TH INTERNATIONAL HEATING AND VENTILATING EXPOSITION IN PHILADELPHIA, PA., JANUARY 24 to 28.

Richmond Engineering Co.

METAL FABRICATORS SINCE 1914

7th & Hospital Sts., Richmond, Va. Phone 7-2611

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G.E. HAS THE ANSWER TO AIR CONDITIONING PROBLEMS IN ANY OFFICE, STORE, OR FACTORY

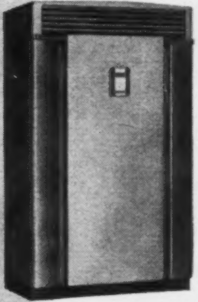
Complete air conditioning for Southwest's first skyscraper requires minimum structural changes

Engineers made a complete climate survey of Amicable Life Building (above), then recommended the conversion of an old freight elevator shaft into equipment rooms on 19 floors to house the specified General Electric Packaged Air Conditioners.

SPACE AND MONEY ARE SAVED BY PUTTING G-E PACKAGED AIR CONDITIONERS IN UNUSED ELEVATOR SHAFT

The Amicable Life Building, Waco's familiar 22-story landmark (completed in 1911), was recently air conditioned from top to bottom. The job was completed with practically no inconvenience to the tenants, and at a minimum cost. Expensive structural changes were avoided by converting an old freight elevator shaft into equipment rooms on every floor, and installing a 10-ton and 5-ton General Electric Packaged Unit on each floor. The project moved along at a rapid pace—it took only a few short weeks to complete the installation, and then only 3 days were required to start, check out, balance and put the 36 G-E Units into perfect operation.

CHECK THESE ADVANTAGES OF USING G-E PACKAGED AIR CONDITIONERS



- *Low installation, low operating costs.*
- *Gives the architect maximum design freedom. Units can be used in space or concealed, with or without ducts.*
- *Streamlined cabinet styling. They add to the decor of any interior.*
- *3, 5, 7½, 10, and 15 ton units can be used singly or in multiple to meet air conditioning needs of any building.*
- *Easily directed air flow for no-draft, no-waste air circulation.*
- *Muggy Weather Control removes excess moisture in any weather without over-chilling or clammy cooling.*
- *Built and factory assembled by General Electric. 5-year warranty covers entire sealed cooling system.*

Write for architectural data. General Electric Co., Commercial & Industrial Air Conditioning Dept., Bloomfield, New Jersey.

Packaged AIR CONDITIONERS

Progress Is Our Most Important Product

GENERAL ELECTRIC

for PEAK PERFORMANCE on All Air Conditioning Systems

buy Sporlan right down the line!

and by Right Down the Line Peak Performance we refer to

4 VITAL ITEMS *that can* *Make or Break* *any Air Conditioning System!*

THERE'S A SPORLAN WHOLESALER NEAR YOU... BE SURE TO CALL HIM TODAY!

Let's look at item No. 1 . . . The Filter-Drier! Clean, dry, acid-free, sludge-free refrigerants are yours when you use a Sporlan Catch-All!

Only Sporlan can offer you the Catch-All, the perfect filter-drier with the molded porous core. It offers the greatest filtering area, and the highest degree of activation for the removal of acid, water, sludge and foreign particles. It cannot powder. It cannot pack, and it dries the refrigerant to an end point so low that any remaining moisture is absolutely harmless!

Sporlan also offers you the perfect answer in item No. 2 . . . Solenoid Valves! Nothing can touch the Peak Performance of Sporlan Solenoid Valves. They're tight closing, their coils are layer wound (not random wound), they're so well insulated, so moisture proof, that they defy electrical failure!

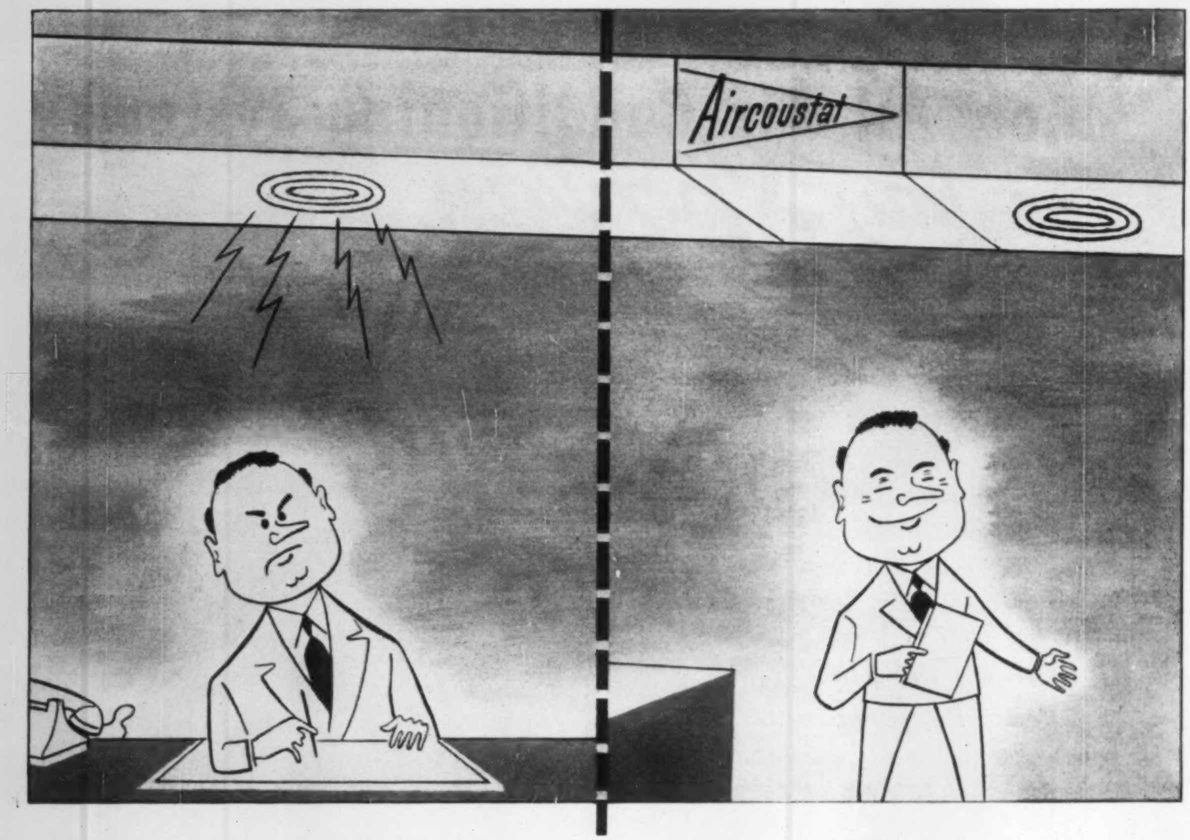
Item No. 3 . . . The Thermostatic Expansion Valve is important, too! For maximum evaporator capacity at all times, it is essential to eliminate hunting in air conditioning valves. Fortunately, thanks to Sporlan's FLOW MASTER element, you will never have to worry over alternately flooded and starved evaporators again . . . just order a Sporlan valve with FLOW MASTER element and Peak Performance is yours!

But, how about item No. 4 . . . The Refrigerant Distributor? To get Peak Performance in all evaporators, Sporlan distributors have a perfectly designed nozzle and conical button to assure uniform distribution to all circuits.

So Remember... item for item, every Sporlan product will give you Peak Performance . . . so why not get Peak Performance Right down the Line on ALL air conditioning applications . . . specify Sporlan throughout!

SPORLAN

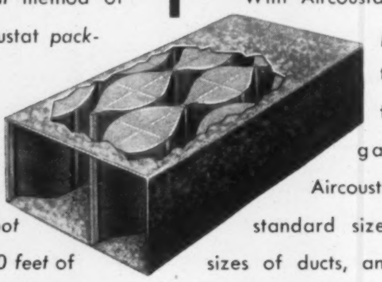
SPORLAN VALVE COMPANY
7525 SUSSEX AVENUE ST. LOUIS 17, MO.
EXPORT DEPARTMENT 89 BROAD STREET NEW YORK 4, N. Y.



Hear the difference . . . with Aircoustat

Here at last is a *practical, economical* method of quieting fan and air noises . . . Aircoustat *packaged silencing!*

Aircoustats are easy to install . . . fit directly into duct work. Result: you save time and money on installation costs. And results are amazing: one *7 foot* unit reduces noise level below what *100 feet* of duct lining could accomplish—with low pressure drop.



With Aircoustat, selection is no problem. This *packaged* unit is so engineered that if it fits geometrically, it fits acoustically. Constructed of galvanized steel or aluminum, Aircoustats are available in nineteen standard sizes for use with all styles and sizes of ducts, and in eight types to meet any desired conditions.

Industrial Sound Control, Inc. also manufactures cooling tower mufflers which end all threat of annoyance from fan or water noises . . . protect your installations from legal shut-downs based on anti-noise regulations. Write TODAY for complete information.

See and hear for yourself the advantages of Aircoustat at the Heating and Ventilating Exposition in Philadelphia Jan. 24-28.

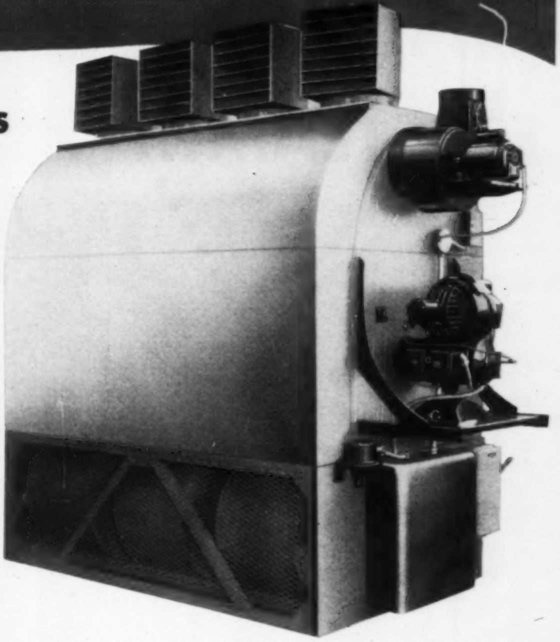
SILENCE SERVICE

Industrial Sound Control Inc.
45 Granby Street, Hartford 12, Conn.

INTRODUCING THE VERSATILE

Commercial-Aire

DIRECT-FIRED SPACE HEATERS



A Modern Concept of

- Combustion Efficiency
- Air Engineering
- Control System Design
- Warm Air Versatility

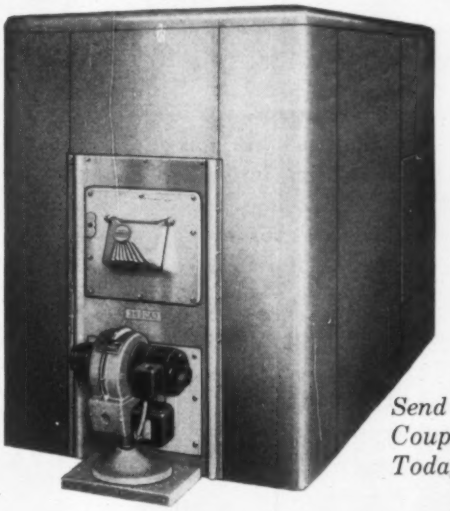
SENSIBLY PRICED

EFFICIENT — Commercial-Aire direct-fired heaters offer a new high in efficiency. Recommended for the proper heating of industrial, commercial and warehouse space. These heaters have a guaranteed combustion efficiency of 80%. Newly designed heat exchanger saves fuel. Oversize primary and secondary transfer surfaces stop heat losses. Separate induction draft blower purges combustion chamber. Delayed relay starts main burner only when heat exchanger is purged. Fan control starts main blower only when proper bonnet temperature is reached.

ECONOMICAL — Commercial-Aire direct-fired heaters burn fuel only when thermostats call for heat . . . no heat waste. Burners shut off when desired temperature is reached . . . no heat transmission loss. No fuel burned to maintain steam pressure or water temperature . . . no cold blast on start. High speed heat discharge maintains proper temperature at working level.

ADAPTABLE — Commercial-Aire direct-fired heaters offer a new high in adaptability . . . burn three types of fuel: heavy oil, light oil, gas, and combination of these fuels. Units are of versatile construction and may be installed in any position, upright, horizontally suspended, and inverted suspended. They are adaptable to direct space heating systems or duct distributing systems. 10 Sizes . . . 300,000 to 2,000,000 B.T.U.'s. Write for complete specifications and prices.

Commercial-Aire SPACE HEATERS ARE MADE BY THE MAKERS OF



MAMMOTH

VERTICAL STEEL TUBULAR HEATERS

Compacto and Adapto models have been long and favorably known. Widely used in churches, schools, factories, auditoriums and commercial buildings where duct type system of heating is indicated. High efficiency comfort heating, with low fuel consumption guaranteed. Write

Send Coupon Today!

MAMMOTH FURNACE COMPANY
511 Vandalia Street, St. Paul, Minnesota

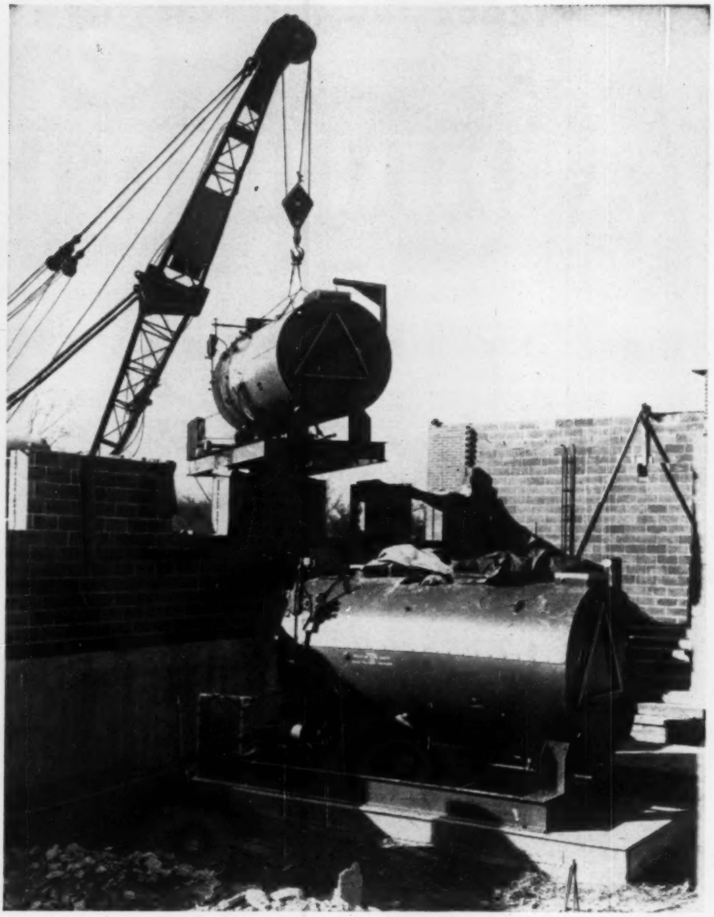
Gentlemen:
Please send promptly full information, prices, etc. on
☐ COMMERCIAL-AIRE DIRECT-FIRED SPACE HEATERS
☐ MAMMOTH VERTICAL TUBULAR STEEL FURNACES

Your Name____________________

Firm Name____________________

Address____________________

City__________ Zone____ State________



FROM START TO STEAM...

...Powermaster® Saves in Many Ways

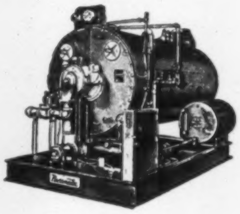
FOR EXAMPLE: Savings with *Powermaster* Packaged Automatic Boilers start with their compact, simplified installation. No special foundation or costly stack is needed. As delivered, *Powermasters* are completely factory assembled and factory fire-tested, fully equipped and wired ready for operation as soon as fuel, electric and flue gas connections are made. Illustrated are two *Powermasters* being installed in a new building under construction.

Once installed, *Powermasters* keep right on saving. High fuel economy at all loads, dependable performance, time-saving attention, maintenance-saving accessibility, automatic operating and safety controls, smokeless combustion, and hospital-clean operation . . . these are reasons steam costs go down where *Powermasters* go in.

To keep your steam costs in line . . . compare *Powermaster*, and you'll see why it is so widely used in schools, colleges, institutions, industrial plants, and all types of buildings. Send NOW for new bulletins on *Powermaster's* cost-saving advantages.

O&S Powermaster® **PACKAGED AUTOMATIC BOILERS**

In sizes to 500 HP; pressures to 250 psi.



ORR & SEMBOWER, INC. • Established 1885 • **Morgantown Road, Reading, Penna.**

weil *Condensate Pumps*

ENGINEERED TO SOLVE YOUR PROBLEMS

Specify the pumps engineered to do the best job! There is a **weil** pump for every heating problem and unusual condition. Ratings, receiver capacities and performance of **weil** pumps meet ASHVE standards.

FOR UNDERGROUND INSTALLATIONS

NRG

Requires minimum space.

Send for
BULLETIN NRG 200-C
Tells you when to use and how to efficiently install an underground condensate pump.

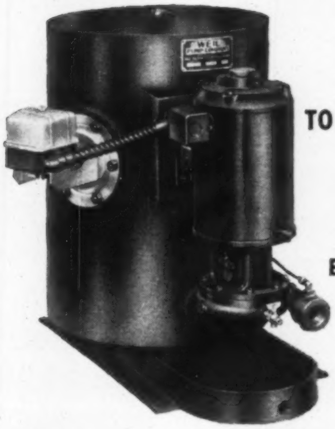
FOR LOW PRESSURE SYSTEMS

TVC

LOW RETURN
CAST IRON RECEIVER
Capacities to 10000 EDR
Send for
BULLETIN TVC 300-B

Available from Jobbers' Stocks
TVC-29—2000 Sq. Ft. E.D.R., 20# P.S.I.
TVC-35—4000 Sq. Ft. E.D.R., 20# P.S.I.

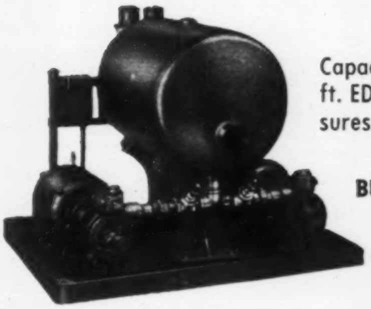
SEND FOR DESCRIPTIVE BULLETINS INTELLIGENTLY DESIGNED TO MAKE PUMP SELECTIONS AND INSTALLATIONS SIMPLE AND EFFICIENT



FOR CAPACITIES TO 50000 SQ. FT. EDR

SRC

Send for
BULLETIN SRC 450



FOR HIGH AND LOW PRESSURE SYSTEMS

TR

Capacities to 150,000 sq. ft. EDR and discharge pressures to 125 lbs.

Send for
BULLETIN TR 100-D

THE EFFICIENCY OF YOUR HEATING PLANT IS DEPENDENT UPON EFFICIENCY AND DEPENDABILITY OF YOUR CONDENSATE RETURN PUMP

weil PUMP CO.
1514 N. FREMONT ST. CHICAGO 22, ILL.

weil *Dependable* PUMPS

IN SWEET'S
1954-1955

anchor fastening devices

Miracle Surface Anchors provide firm support for block or board types of insulation, furring strips, wood runners, conduits, pipes, fixtures, etc. on all types of clean, rigid surfaces. These devices also provide anchorage in otherwise inaccessible locations. Miracle Surface Anchors consist of perforated metal plates 2" x 2" or 2¾" x 2¾" to the center of which is welded a spindle, prong, nail, bolt or threaded stud; selection depends upon the material and load to be supported. The perforated base is designed to provide anchorage by bonding it to masonry, metals, wall boards, plaster, tile, glass, etc., with Miracle Anchor Adhesives which are manufactured in many formulations to meet various requirements.

advantages

Zinc coating with a dichromate finish resists corrosion—eliminates delamination and sagging of glass fiber and soft board types of insulation—eliminates drilling, welding, expansion bolts—reduces time, construction and installation costs—no damage to surfaces in event of removal of installation.

features

load capacity: 2" x 2" anchor safely supports 5 lbs/anchor; 2¾" x 2¾" anchor safely supports 10 lbs/anchor.

spacing: approximately 12" on centers, depending upon load requirements.

coverage: one man can install 200 anchors per hour; approximately ¼ of time required for mechanical anchorage.

adhesives for anchors

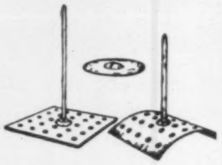
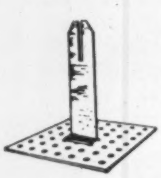
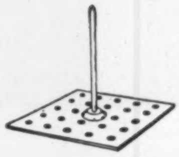
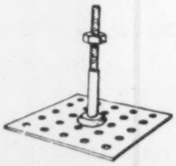
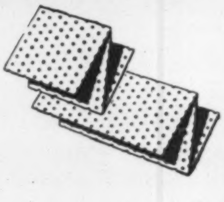
Anchor Adhesives: for temperatures from −40° F to +200° F.

RT-1000: from +200° F to +450° F or when asphalt primers or compounds are involved.

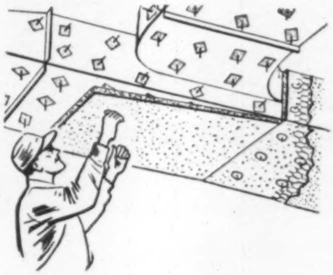
NP-153: for extra low temperatures (or RT-1000 if applied over asphalt coatings).

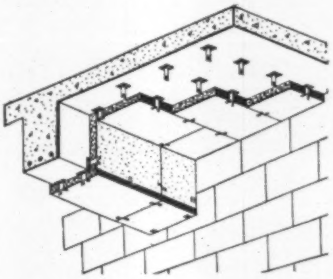
installation of anchors

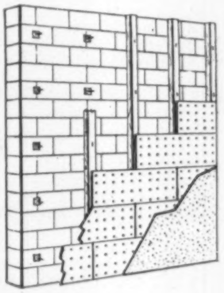
Bonding surfaces must be clean and rigid. Do not bond to cold water paints. Apply a walnut sized "blob" of Miracle Anchor Adhesive on anchor base with a putty knife to insure a film of adhesive approximately 1/16" thick after the anchor will have been firmly pressed into place by a twisting motion to insure wet adhesive coming into contact with both surfaces. Allow to set for 48 hours at normal room temperature before attaching any load.

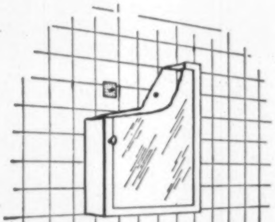
anchors	description
■ **spindle anchor and washer** 	For bonding cork, Fiberglas, batts, Foamglas, mineral wool, etc., to ducts, walls and ceilings. Also for support of wire mesh for plaster finish. Lock washer is designed to hold insulation firmly in place thus eliminating delamination of insulation. Curved plate available for attachment to convex surfaces.
■ **pronged anchor** 	For bonding block insulation such as Foamglas to ducts, walls and ceilings. Pronged Anchors are set between rows of block insulation and prongs bent in reverse direction over blocks. For wire mesh with plaster finish, 1 prong of each Anchor is bent over block insulation, the other prong penetrating mesh, then bent over before applying plaster finish. Alternate type anchor available for support of small cables, tubing, air lines, etc.
■ **anchor nail** 	For bonding furring strips to Masonry walls for the attachment of wallboard. Also for installing wood floor runners on concrete floors to support 2" solid partitions (½" plaster board plus ¾" plaster both sides). No drilling for mechanical anchorage.
■ **anchor bolt** 	For attaching cabinets, towel, tissue and other types of dispensers to tile or other rigid surfaces. Also used for attaching plastic, wood or metal letters to glass or masonry. No drilling required.
Z-clips 	For attaching wallboard, plasterboard, insulation board, etc. to exterior walls when an air space is required. Hinged construction takes up irregularities in surface to which they are bonded. Clips are 2" x 2" or 2" x 4" perforated 20 ga. steel.

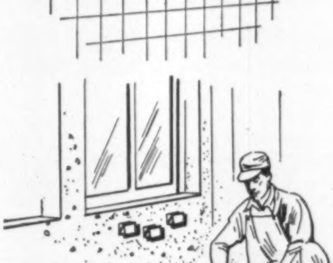
example











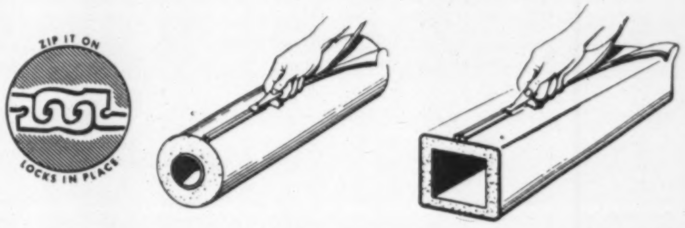
direct adhesion

Miracle Adhesives are manufactured in many formulations (see back cover) to suit the direct bonding of insulation materials to metal, brick, concrete, wood, building boards, etc., for on-the-job application. Listed on the back cover are adhesives suited for production line and plant use by trowel, paint, spray, or roller application.

curtain walls: In conjunction with several Porcelain Enamel Manufacturers, Miracle Adhesives Corporation has developed (1) adhesives for bonding or laminating porcelain enamel pans to either side of an insulation core, and (2) a permanent plastic sealing compound for the sealing of joints between panels.

roof decks: By invitation of the Metal Roof Deck Institute we have produced a Roofing Cement specially formulated to lower roof fire hazards; to be used for attaching rigid roof insulation directly to steel deck. A companion item is a high temperature resistant non-combustible caulking compound which seals side laps of metal roof decks, thus assuring a vapor tight joint. Both products can also be used on precast concrete slab decks.

PROTEKTINSUL for pipe and duct covering finish



Protektinsul is a unique development for thermal insulation pipe covering. It is a .012″ thick prefabricated, poly-vinyl chloride outer finish, designed to protect insulation against weather, abrasion, chemicals, mildew, etc. It is furnished to exact size and requires no cutting, fitting or sewing in the field because of its zip-on application.

advantages

- an integral, all poly-vinyl zip closure insures watertight, airtight longitudinal joints.
- barrier against moisture-vapor transmission and corrosion.
- protection against soil chemicals and fungus; provides waterproof barrier on underground lines, in conduits, etc.
- protection against electrolytic corrosion due to galvanic action or stray current effects because of its dielectric strength and electrical insulation resistance.
- nonflammable; will not support combustion.
- furnished in several standard colors or in color combinations for identification purposes.
- joints and fittings: covered with tape made from same poly-vinyl compound as covering itself; sealed with vinyl sealing liquid to insure uniform characteristics and the same protection for the entire installation.

properties

Tensile Strength in psi	1600
Elasticity	Excellent
Temperature limit	+200° F to —60° F
Moisture Vapor Transmission Rate gms/100sq. in. /24 hrs.	1.5 ASTM test # Jan-P-127
Dielectric strength /mil of thickness approx.	1000V
Insulation Resistance greater than	100,000 megohms

No tendency to rot or check after prolonged exposure to underground conditions or as result of exposure to weather.

miracle adhesives corporation

214 E. 53 St., New York 22, New York

"We have 1955's BIG opportunity for you, Mr. Dealer!"

"Airtemp has just completed its 20th year of progress in air conditioning. And now, entering 1955, the opportunity for air conditioning dealers to progress with us is greater than ever before, because:

Most people know the Airtemp name, associate it with engineering leadership, have confidence in the products which carry it. (Airtemp is the name that will make your selling job easier in 1955!)

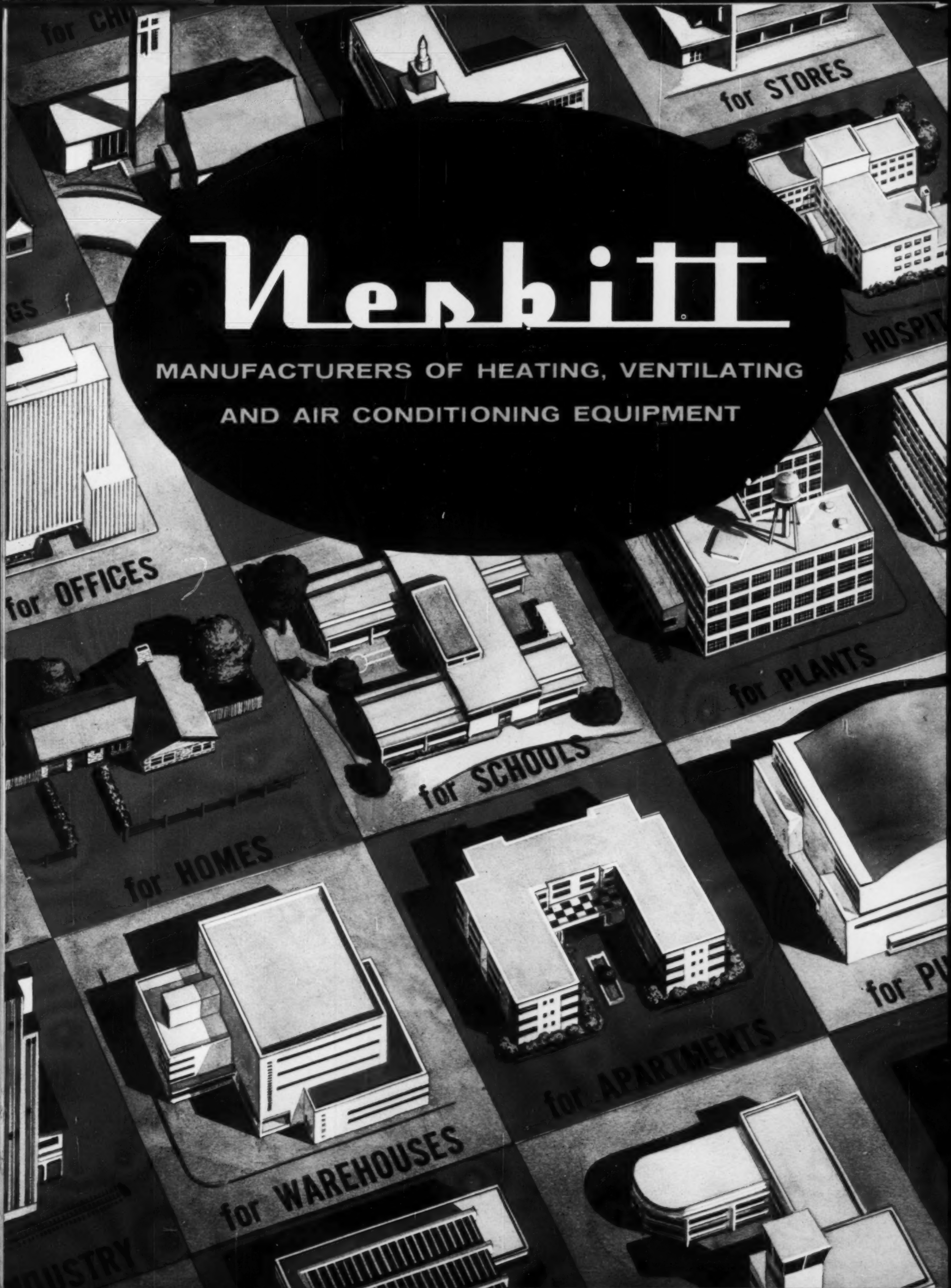
Our Packaged Air Conditioners are the best value in the industry. This is due to better tooling and improved manufacturing methods, yet quality is to the same standards as before. This is proved by our recent reduction in the cost of the five-year warranty charge, which includes freight and labor.

We make waterless air cooled air conditioners in 2, 3, 5, and 7½ h.p. sizes. They have been proved in many thousands of installations. The Airtemp compressor has demonstrated its ability to stand up under high head pressures. So, with Airtemp, you can sell anywhere; no need to worry about condensing water.

Sound like your *BIG* opportunity for bigger profits in 1955? Then drop me a line today! I will personally see that you get all of the facts and figures—*fast!*"

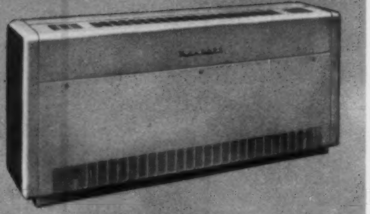
J. F. KNOFF
VICE PRESIDENT IN CHARGE OF SALES

AIRTEMP
DIVISION OF CHRYSLER, DAYTON 1 OHIO


for CH
for STORES
GS
HOSPIT
for OFFICES
for HOMES
for SCHOOLS
for PLANTS
for APARTMENTS
for P
for WAREHOUSES
USTRY

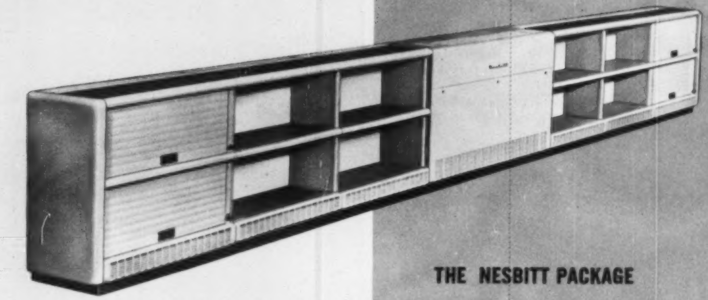
Nesbitt

MANUFACTURERS OF HEATING, VENTILATING
AND AIR CONDITIONING EQUIPMENT



THE NESBITT SYNCRETIZER

The unit ventilator that sets a new standard of classroom comfort. Four models 32" and 28" high, 750 to 1560 CFM. **Publication 100**



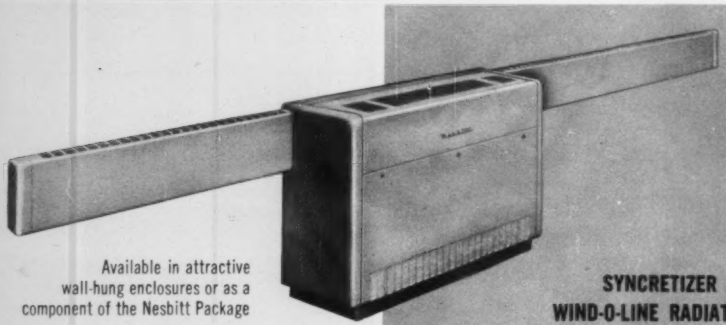
THE NESBITT PACKAGE

Nesbitt Syncretizer and Wind-o-line Radiation integrated with Nesbitt Storage Cabinets for classroom beauty, utility, daylong comfort and overnight protection. Ensembles 32" and 28" high, any required length. **Publication 101**

THIS IS TODAY'S Nesbitt LINE OF HEATING, VENTILATING AND AIR CONDITIONING EQUIPMENT

It is the result of more than 40 years of demonstrated leadership in scientific research, engineering, development, manufacturing, and marketing for the attainment of ever higher standards of thermal comfort indoors—with utmost economy and dependability.

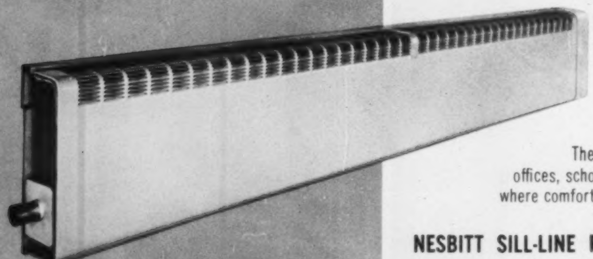
In keeping with this checkered arrangement, you would naturally expect us to say, It's your move! And indeed it is. Nesbitt is ready to meet practically every heating equipment need. An ever enlarging group of successful engineers and contractors are enjoying the ease and profit of playing it Nesbitt "across the board." Let us crown you king: send for any or all of the publications listed here.



Available in attractive wall-hung enclosures or as a component of the Nesbitt Package

SYNCRETIZER AND WIND-O-LINE RADIATION

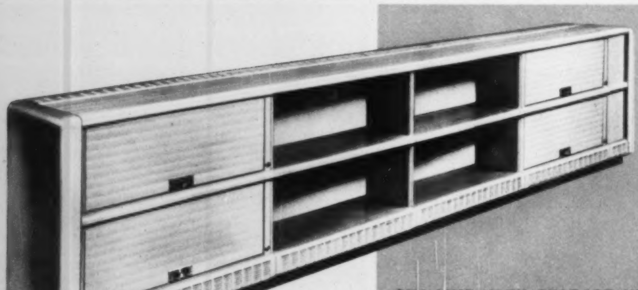
The system of positive protection against cold surfaces. Integrated with Syncretizer to provide convected and radiated heat along room perimeters to overcome cold downdraft, achieve a symmetrical thermal environment. Capacities 450, 550 and 700 Btu/lineal foot. **Publication 101**



The attractive way of heating offices, schools, apartments, churches where comfort and beauty are important

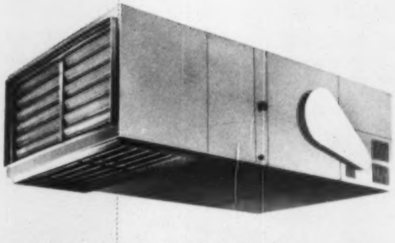
NESBITT SILL-LINE RADIATION

Modern high capacity finned radiation for window and wall perimeters, in casings styled for today's interiors. Rigid, long-life construction, draft-free comfort, low installation cost. Standard lengths, 700 to 2675 Btu/lineal foot, accessories for every need. **Publication 102**



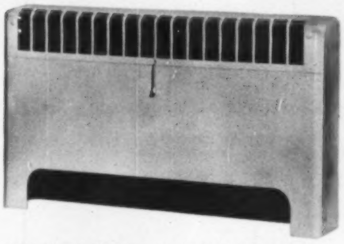
SILL-LINE WITH STORAGE UNITS

Combining the advantages of perimeter heating with the utility of attractive storage units at moderate cost. Ensembles 32" and 28" high, capacities 700 to 2600 Btu/lineal foot. **Pub. 261, Section S**



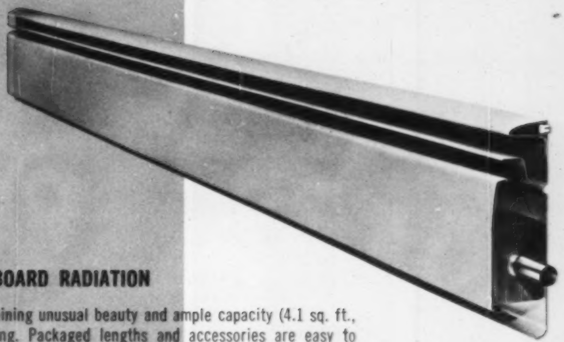
THE NESBITT THERMOVENT

For heating and ventilating large interiors. Sound-treated for quieter operation. Choice of models, 1250 to 15,000 CFM. **Publication 270**



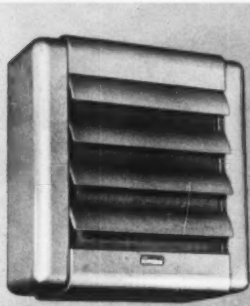
NESBITT MODEL U CONVECTOR

Custom-quality universal units in 23 stock sizes, 13 to 88.5 sq. ft. EDR, at production economy. Approved CS140-47 ratings. **Publication 262**



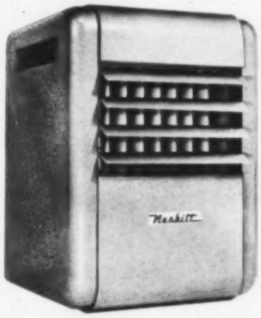
NESBITT BASEBOARD RADIATION

A new approach in design combining unusual beauty and ample capacity (4.1 sq. ft., EDR) for true perimeter heating. Packaged lengths and accessories are easy to buy and install—save time and money. I-B-R approved. **Publication 272**



WEBSTER-NESBITT UNIT HEATER

Standard propeller fan heaters for steam and hot water; 18,000 to 330,000 Btu/hr., 300 to 5200 CFM. Nine basic sizes. **Publication WN126**

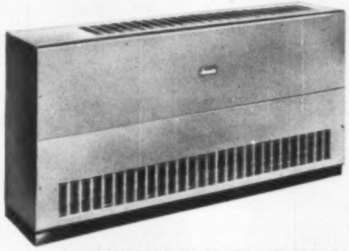


NESBITT GAS-FIRED UNIT HEATERS

Seven models, 25,000 to 200,000 Btu input. A.G.A. and U.L. approved for all gases. **Publication 280**

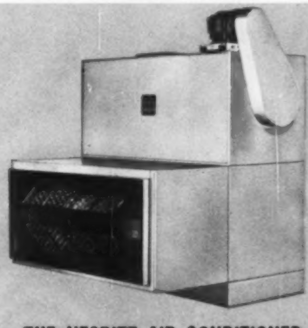
WEBSTER-NESBITT LITTLE GIANT

Propeller fan unit heaters with blower fan performance characteristics. Eight sizes, 28,500 to 510,000 Btu/hr. **Publication WN134**



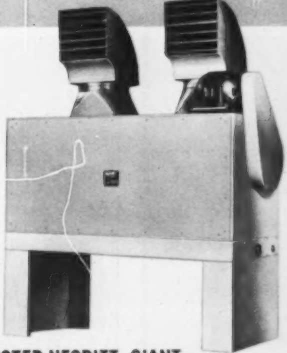
WEBSTER-NESBITT SERIES C

Recessed or non-recessed cabinet heaters in 5 sizes, 34 to 74½"; choice of mounting. Steam or water, 107 to 618 sq. ft. EDR. **Pub. WN136**



THE NESBITT AIR CONDITIONER

A new approach in air conditioner design featuring the double coil for improved comfort and processing. From 2 to 125 tons. **Publication 501**



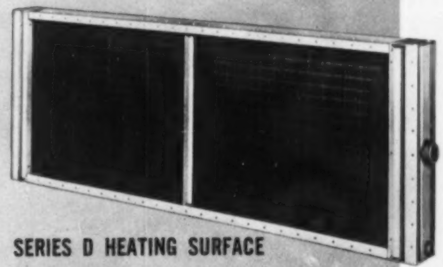
WEBSTER-NESBITT GIANT

Large heating and/or ventilating units for free or static delivery, steam or hot water. Wide capacity range; 2, 3-fans. **Publication WN135**

SERIES H HEATING SURFACE

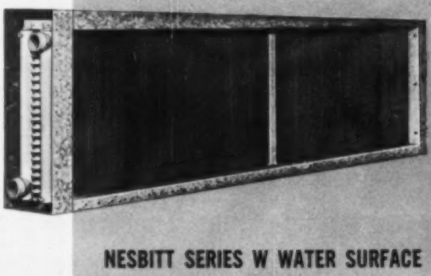
(not illustrated)

General purpose blast coil surface for heating, ventilating, air conditioning and drying in both high and low pressure systems. Copper tubes, aluminum or copper fins. Made in seven types, full range of sizes. **Publication 248**



SERIES D HEATING SURFACE

With Nesbitt steam-distributing tubes. Freeze-proof. Type DS with single header, single or DUAL tubes in sizes up to six feet. Type DD with two supply headers, DUAL tubes for uniform discharge temperatures. Sizes, 78" to 10 feet. **Publication 247**



NESBITT SERIES W WATER SURFACE

For air cooling, dehumidifying or heating. Copper tubes, aluminum or copper fins. Continuous tube types: Freeze-proof WD with drain feature and pitched in the casing; WB without drain. **Publication 246.** Cleanable-tube WC. **Publication 255**

Where to Buy NESBITT
HEATING AND VENTILATING PRODUCTS

The
Enlarging
Circle of
NESBITT
Heating and Ventilating
Products

SALES OFFICE DIRECTORY, LISTED ALPHABETICALLY BY CITIES, FOR THE VARIOUS GROUPS OF PRODUCTS MADE BY NESBITT

GROUP 1

SCHOOLHOUSE HEATING AND VENTILATING EQUIPMENT

The Nesbitt Syncretizer, Nesbitt Wind-o-line Radiation, The Nesbitt Package, Nesbitt Thermovent, Nesbitt Sill-line with Storage Units, and Nesbitt DeLuxe Cabinet Heaters are sold through offices of the American Blower Corporation (ABC) and John J. Nesbitt, Inc. (JJN) as follows:

City and State	Street Address	Telephone
ALBANY 7, N. Y. (JJN)	93 State Street, Room 43	Albany 6-7661
ALBUQUERQUE, N. M. (ABC)	112 W. Granite Avenue	3-2247
ATLANTA 3, GA. (ABC)	101 Marietta Street	Walnut 5617
BALTIMORE 18, MD. (JJN)	33 E. 21st Street	Belmont 5-5895
BIRMINGHAM 3, ALA. (ABC)	1638 Brown Marx Bldg.	7-2383
BOSTON 15, MASS. (JJN)	236 Huntingdon Avenue	Copley 7-4202
BUFFALO 16, N. Y. (JJN)	1441 Hertel Avenue	Delaware 3739
CHARLESTON, W. VA. (ABC)	1029 Virginia Street	6-1331
CHARLOTTE, N. C. (ABC)	Commercial Bank Bldg. 200 South Tryon St.	3-8444
CHICAGO 1, ILL. (ABC)	228 N. LaSalle Street	Financial 6-2531
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CLEVELAND 15, OHIO (ABC)	1010 Euclid Avenue	Main 1-6846
COLUMBUS, OHIO (JJN)	101 N. High St., Rm. 302	Adams 7559
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DES MOINES 9, IOWA (ABC)	506 Securities Bldg. 418 Seventh Street	4-1631
DETROIT 2, MICH. (ABC)	632 Fisher Building	Trinity 2-4300
EL PASO, TEXAS (ABC)	609 Laurel Street	3-7575
FT. WAYNE, IND. (ABC)	514 Gettle Building	Eastbrook 7673
GRAND RAPIDS, MICH. (ABC)	211 Assn. Commerce Bldg.	8-1357
GREENVILLE, S. C. (ABC)	105 Palmetto Building	2-4286
HARRISBURG, PA. (JJN)	835 S. 13th Street	Harrisburg 8-8144
HOUSTON 2, TEXAS (ABC)	1909 Travis Street	Preston 6171
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SEATTLE 9, WASH. (ABC)	1305 Republican Street	Seneca 5860
SO. BEND, IND. (ABC)	211 Lafayette Building	3-9305
SPRINGFIELD, MASS. (JJN)	1537 Main Street	Springfield 2-1878
SYRACUSE, N. Y. (JJN)	1105 State Tower Building	Syracuse 2-9202
TAMPA 1, FLA. (ABC)	509 Twiggs Street	2-2506
TOLEDO 12, OHIO (ABC)	4359 Kingsbury Avenue	Lawndale 7297
TULSA 3, OKLA. (ABC)	817 S. Boulder Street	3-5223
WASHINGTON, D. C. (ABC)	Washington Building 15th & N. Y. Ave., N. W.	National 8-2872

In Canada these products are sold through Canadian Sirocco Company, Ltd., P. O. Box 360, 310 Ellis Street, Windsor, Ontario.

GROUP 2

Complete sales and service for Nesbitt Baseboard Radiation, Model U Convectors, Gas-Fired Unit Heaters, and Nesbitt Wall-Hung Sill-line Radiation are provided by the following offices:

ALBANY 7, NEW YORK	93 State St., Room 43	Albany 6-7661
ATLANTA 3, GEORGIA	305 Techwood Drive NW	Lamar 565
BALTIMORE 18, MARYLAND	33 E. 21st Street	Belmont 5895
BOSTON 15, MASS.	236 Huntington Avenue	Copley 7-4202
CHICAGO, ILLINOIS	10839 Vernon Ave., So.	Waterfall 8-5313
CLEVELAND 15, OHIO	958 Hanna Building	Prospect 1-2320
COLUMBUS, OHIO	101 N. High Street	Adams 7559
DETROIT 11, MICHIGAN	2832 E. Grand Boulevard	Trinity 1-3880
JOHNSTOWN, PENNA.	206 Fisher Building	Johnstown 9-4108
LOS ANGELES, CALIFORNIA	1101 Riverside Drive	Capitol 2-0125
MILWAUKEE, WISCONSIN	5114 W. Center Street	Hilltop 5-2983
NEW YORK 7, NEW YORK	11 Park Place	Barclay 7-0260
NEW YORK, NEW YORK	122 East 42nd Street	Oxford 7-2474
OMAHA, NEBRASKA	4916 Gretchen Avenue	Prospect 1758
ORANGE, NEW JERSEY	285 Main Street	Orange 3-5873
PHILADELPHIA 36, PA.	State Road & Rhawn St.	Devonshire 2-2400
PITTSBURGH, PENNA.	501 Columbia Building	Atlantic 1-9536
PORTLAND, OREGON	2925 N. E. Glisan	East 2977
RICHMOND, INDIANA	102 North 14th Street	7-0084
RICHMOND, VIRGINIA	731 Northside Avenue	7-8762
SPRINGFIELD, MASS.	1537 Main Street	Springfield 2-1878
SYRACUSE, NEW YORK	1105 State Tower Building	Syracuse 2-9202
TOLEDO 13, OHIO	2157 Mansfield Road	Lawndale 3226
WATERLOO, IOWA	501 Lafayette Building	3-3766

GROUP 3

Nesbitt Heating and Cooling Surfaces are available from the following offices:

ALBANY 7, NEW YORK	93 State Street, Rm. 43	Albany 6-7661
BALTIMORE 18, MD.	33 East 21st Street	Belmont 5-5895
BOSTON 15, MASS.	236 Huntington Ave., Rm. 410	Copley 7-4202
BUFFALO 16, N. Y.	1441 Hertel Avenue	Delaware 3739
CLEVELAND 3, OHIO	4500 Euclid Ave., Rm. 208	Utah 1-5244
DAVENPORT, IOWA	320 Western Avenue	7-6123
DES MOINES 9, IOWA	1112 Locust Street	8-5721
GREENVILLE, S. C.	104 East Stone Avenue	3-7488
INDIANAPOLIS 20, IND.	5425 College Avenue	Broadway 9233
JOHNSTOWN, PENNA.	206 Fisher Building	Johnstown 9-4108
MELROSE 76, MASS.	507 Main Street	Melrose 2404
NEW YORK 7, N. Y.	11 Park Place	Barclay 7-0260
ORANGE, NEW JERSEY	285 Main Street	Orange 3-5873
ORLANDO, FLORIDA	1623 E. Washington Street	2-2252
PITTSBURGH, PENNA.	1004 Columbia Building	Atlantic 1-9536
ST. LOUIS 8, MO.	3923 W. Pine Boulevard	Franklin 1137
SALT LAKE CITY, UTAH	44 West Eighth South	22-2537
SEATTLE 9, WASH.	1800 Taylor Avenue	Garfield 482
SPRINGFIELD, MASS.	1537 Main Street, Rm. 412	Springfield 2-1878
SYRACUSE, NEW YORK	Rm. 1105, State Tower Bldg.	Syracuse 2-9202
TOLEDO 13, OHIO	2157 Mansfield Road	Lawndale 3226

GROUP 4

Webster-Nesbitt Giant, Little Giant, Propeller Fan, and Series C Unit Heaters are sold exclusively by Warren Webster & Company, Camden 5, N. J., with branch offices in principal cities. Look for Warren Webster & Company in the local telephone directory.

JOHN J. Nesbitt INCORPORATED

Main Office and Factory: HOLMESBURG, PHILADELPHIA 36, PA. — Telephone DEvonshire 2-2400

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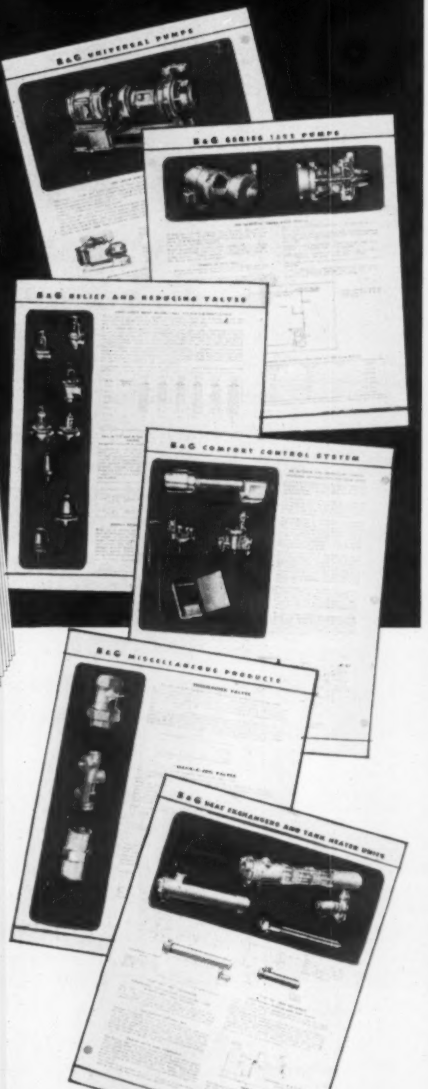
B&G UNIVERSAL PUMPS
B&G SERIES 1522 PUMPS
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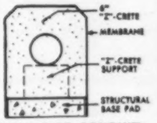
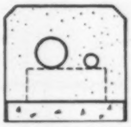
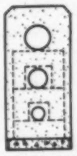


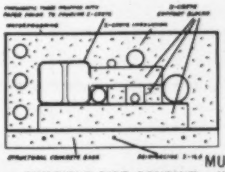
SINGLE PIPE CONDUIT



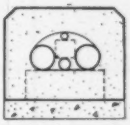
TWO PIPE CONDUIT



PIPE OVER PIPE



MULTIPLE PIPE CONDUIT



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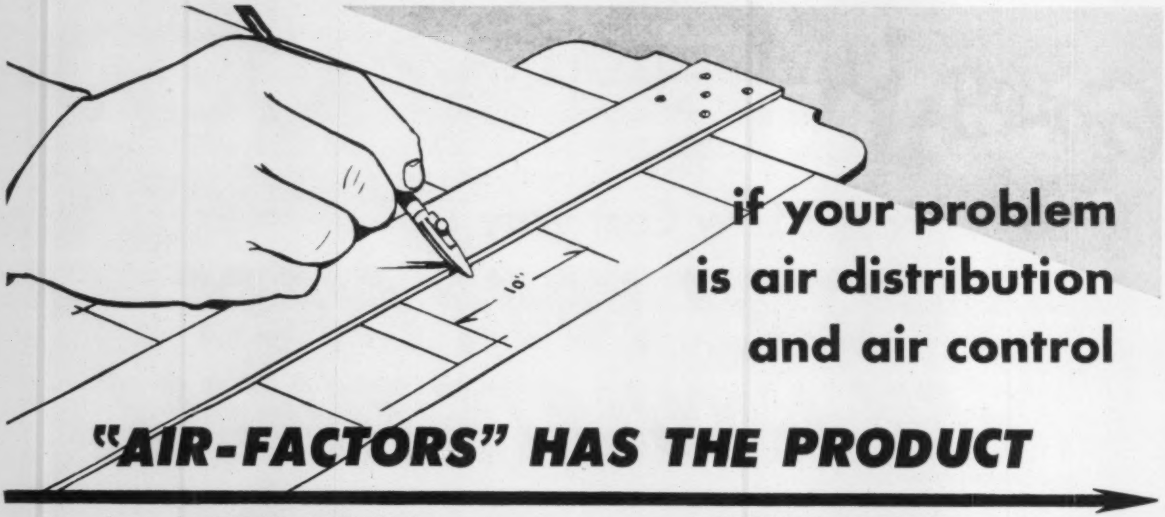

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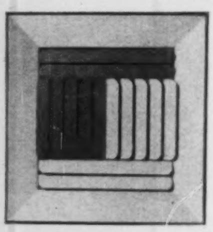
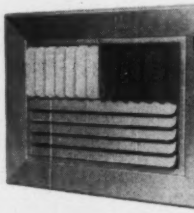

Model 4B60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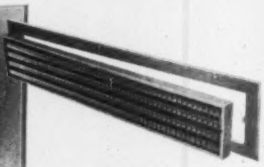
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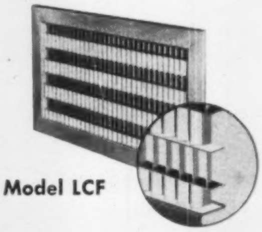
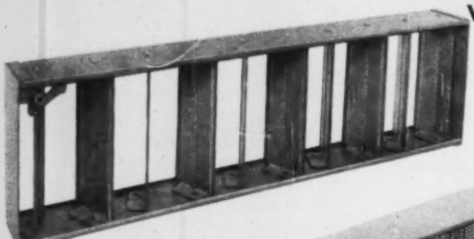

Model LCF

VOLUME CONTROLS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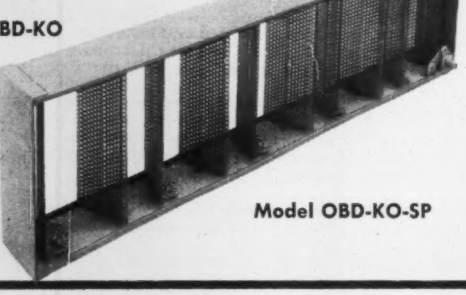
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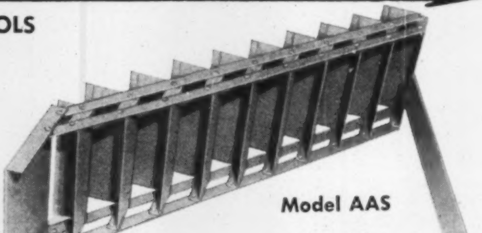
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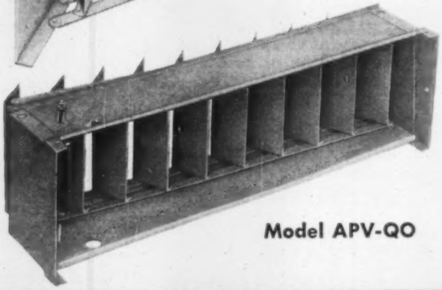
Model APV-QO

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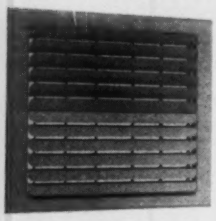
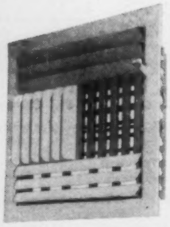

Model ECCO-2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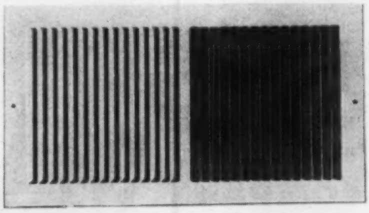
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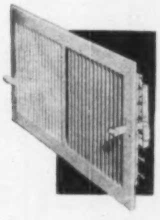
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DIFFUSERS
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UNITED STATES
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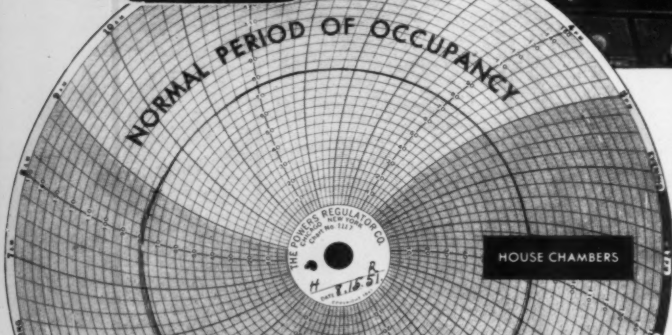
Uses POWERS® System of AIR CONDITIONING CONTROL

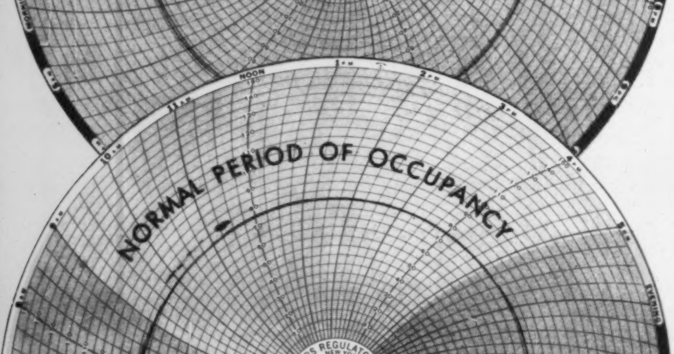
Right: Joint session of the Congress in the recently remodeled House of Representatives—listening to "State of the Union" address by the President.

In the historic House and Senate Chambers as well as the administrative offices in the Capitol, heating and air conditioning systems are regulated by a Powers system of pneumatic control.

Only a few of the many types of Powers Control used in the Capitol are shown here.
Left: Powers Two-pen Recording Controller.



HOUSE CHAMBERS



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POWERS AIR CONDITIONING CONTROL

◀ **Note Accurate Control in House and Senate Chambers**

Outdoor temperatures, during the period covered by the temperature charts varied between 75 and 95° F., yet indoor temperature was maintained constant from 9 A.M. to 5 P.M. One temperature sensitive bulb is located near the speaker's rostrum, another is in the gallery. Note separate lines during the off period of control and how the two lines merge into one when Chambers were occupied.

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Offices in 60 Cities in U.S.A., Canada, and Mexico • See Your Phone Book
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Powers Room
Type Thermostat

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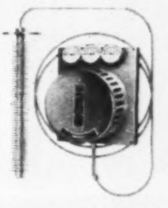
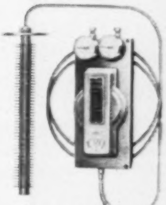
Experience gained by Powers in supplying dependable temperature and humidity regulation for these buildings may be helpful to you. When your problems involve precise control for heating or air conditioning, contact Powers nearest office . . . in over 60 cities.

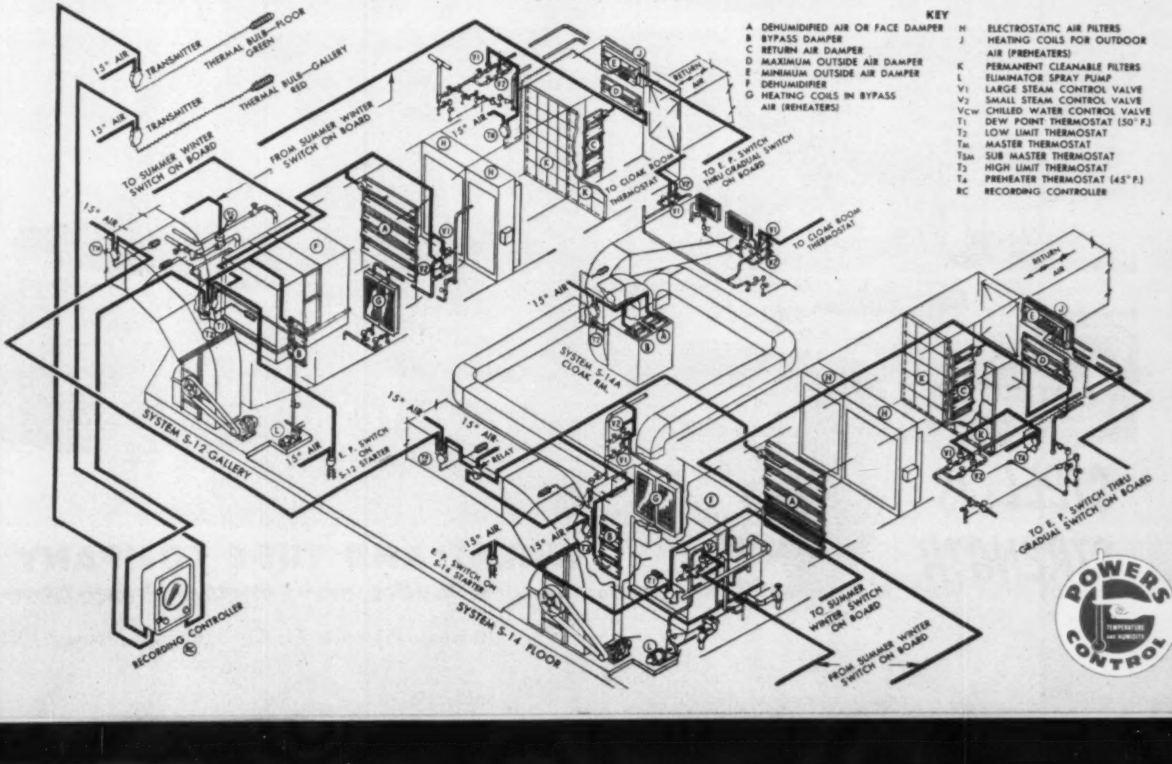




Powers Remote Bulb Thermostats for Dew Point, Low and High Limit, Preheater, Master and Sub-Master Control
—only a few of the many controls used in the Capitol.

AIR CONDITIONING APPARATUS DIAGRAM FOR OPERATION AND MAINTENANCE OF SYSTEMS IN THE HOUSE AND SENATE CHAMBERS

Courtesy of Charles S. Leopold


15" AIR
TRANSMITTER
THERMAL BULB—FLOOR GREEN
THERMAL BULB—GALLERY RED
TO SUMMER WINTER SWITCH ON BOARD
FROM SUMMER WINTER SWITCH ON BOARD
RETURN AIR
TO CLOAK ROOM THERMOSTAT
TO E. P. SWITCH THRU GRADUAL SWITCH ON BOARD
SYSTEM S-12 GALLERY
E. P. SWITCH ON S-12 STARTER
RELAY
SYSTEM S-14A CLOAK RM.
E. P. SWITCH ON S-14 STARTER
SYSTEM S-14 FLOOR
RECORDING CONTROLLER
TO SUMMER WINTER SWITCH ON BOARD
FROM SUMMER WINTER SWITCH ON BOARD
TO E. P. SWITCH THRU GRADUAL SWITCH ON BOARD

KEY

A	DEHUMIDIFIED AIR OR FACE DAMPER
B	BYPASS DAMPER
C	RETURN AIR DAMPER
D	MAXIMUM OUTSIDE AIR DAMPER
E	MINIMUM OUTSIDE AIR DAMPER
F	DEHUMIDIFIER
G	HEATING COILS IN BYPASS AIR (REHEATERS)
H	ELECTROSTATIC AIR FILTERS
J	HEATING COILS FOR OUTDOOR AIR (PREHEATERS)
K	PERMANENT CLEANABLE FILTERS
L	ELIMINATOR SPRAY PUMP
V_1	LARGE STEAM CONTROL VALVE
V_2	SMALL STEAM CONTROL VALVE
V_{CW}	CHILLED WATER CONTROL VALVE
T_1	DEW POINT THERMOSTAT (50° F.)
T_2	LOW LIMIT THERMOSTAT
T_M	MASTER THERMOSTAT
T_{SM}	SUB MASTER THERMOSTAT
T_3	HIGH LIMIT THERMOSTAT
T_4	PREHEATER THERMOSTAT (45° F.)
RC	RECORDING CONTROLLER

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TEMPERATURE AND HUMIDITY

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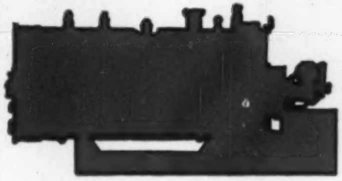
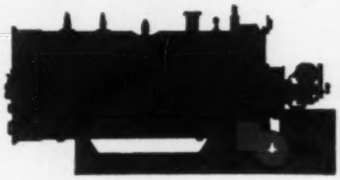
HOW SUPERIOR SOLVES YOUR STEAM PROBLEMS



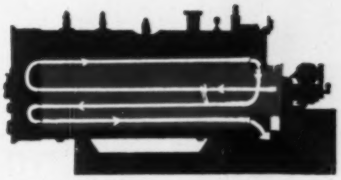
A COMPLETE PACKAGE

Completely factory-assembled and tested, a Superior Steam Generator is backed by undivided responsibility.



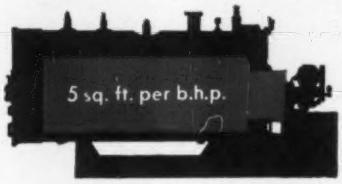
INDUCED DRAFT THAT'S BUILT-IN

. . . eliminates need of an expensive chimney . . . Multiple fans draw evenly on all tubes, reducing maintenance.



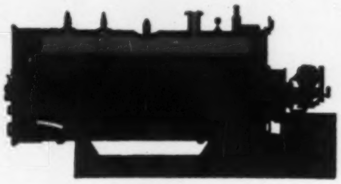
4-PASS, DOWN-DRAFT DESIGN

High gas velocities produce high efficiency. Down-draft design promotes rapid evaporation, quicker steaming.



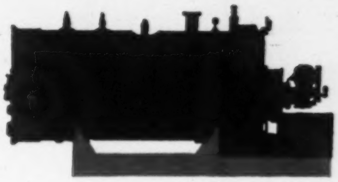
AMPLE HEATING SURFACE

A minimum of 5 sq. ft. of heating surface per boiler horsepower assures maximum efficiency at full rated capacity.



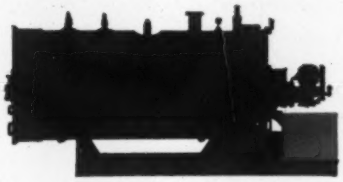
RESERVE CAPACITY

Greater steam space and large evaporating surface provide ample reserve capacity & better than 99% dry steam.



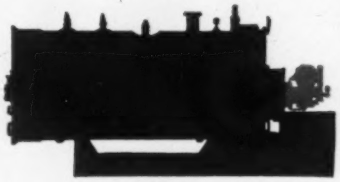
NO EXPENSIVE FOUNDATION

Built on a rigid channel iron base, a Superior Steam Generator needs only a floor capable of supporting its weight.



BUILT-IN CONTROLS

All controls essential to completely automatic operation are factory-wired into an easily accessible control panel.



BURN OIL, GAS, OR BOTH

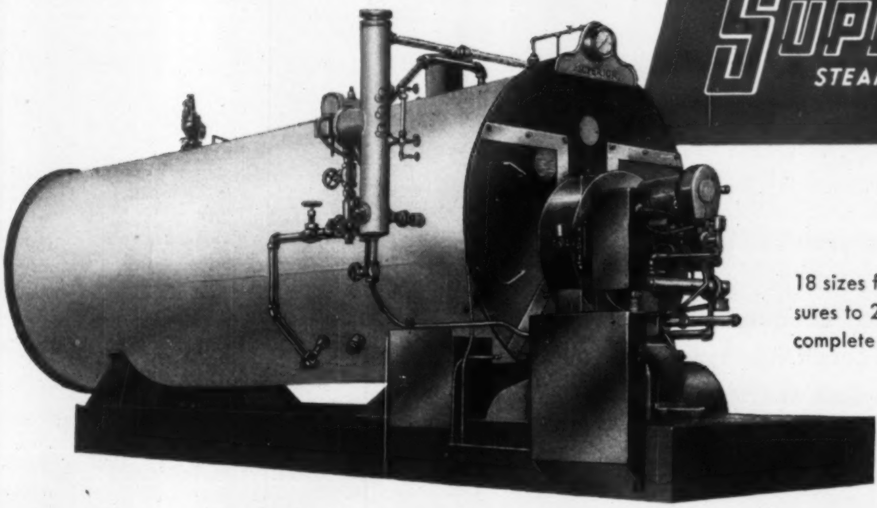
Superior Burners burn oil or gas or a combination of both . . . changing from one fuel to the other in seconds.

Superior Steam Generators are the ideal choice for a new steam plant . . . the simplest answer to expanding your present plant . . . the easiest solution to replacing obsolete boilers.

Guaranteed to develop maximum rated capacities at thermal efficiencies in excess of 80%, their design embodies features which insure long-lived dependability and maximum fuel economy.

for performance you can **BANK** on

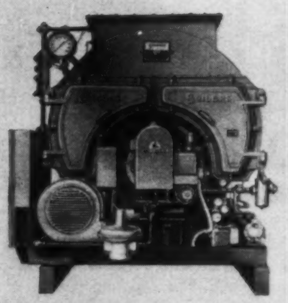
Superior
STEAM GENERATORS



18 sizes from 20 to 600 b.h.p. for pressures to 250 p.s.i. or for hot water. For complete details write for Catalog 704.

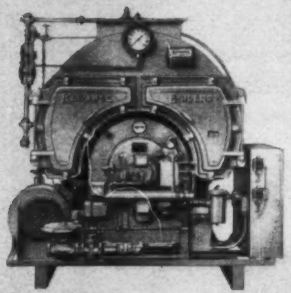
SUPERIOR COMBUSTION INDUSTRIES INC. TIMES TOWER, TIMES SQUARE, NEW YORK 36, N.Y.

3 winning combinations



KEWANEE-IRON FIREMAN BOILER-BURNER UNIT

Planned as perfectly integrated units—combined for the highest in efficient performance—these 3 matched Boiler-Burner Units represent the merged knowledge, experience and judgment of experts in both boiler and burner fields. Here, truly, are 3 of the finest Boiler-Burner Units for high or low pressure heating—power and process steam—oil, gas, or oil-gas combinations. You can be sure of dependable performance from a ...



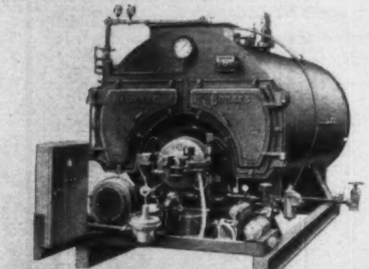
KEWANEE-RAY BOILER-BURNER UNIT

KEWANEE

reserve plus rated

Boiler

You can be sure of lower operating cost and higher efficiency. Reserve Plus Rating certifies that 50% or more power is built in to provide for piping, pickup and additional capacity requirements. It means "cruising speed" operation with extra reserve power to take care of emergencies. It means ratings based on nominal capacity, not maximum capacity.



KEWANEE-PETRO BOILER-BURNER UNIT

8.2 SQUARE FEET OF HEATING SURFACE PER BOILER HORSEPOWER ... IN STRICT ACCORDANCE WITH THE PROVED CODE OF THE STEEL BOILER INSTITUTE—80% CERTIFIED EFFICIENCY.

See these 3 Units in the Kewanee exhibit at the ASH&VE Exposition, Philadelphia, Pennsylvania, January 24-28, 1955.

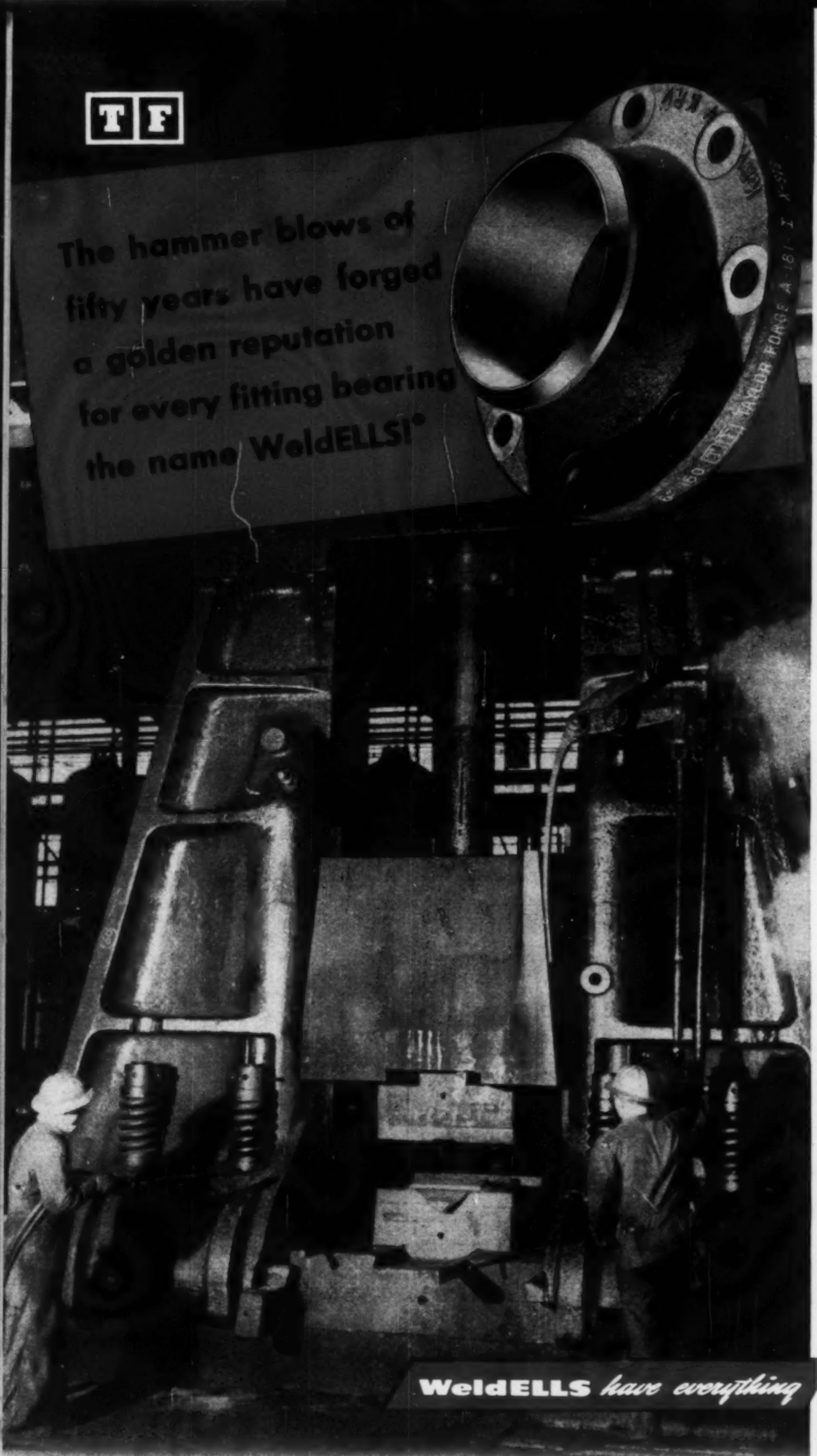
KEWANEE BOILERS

KEWANEE-ROSS CORPORATION, Kewanee, Illinois

Division of American Radiator & Standard Sanitary Corporation

Serving home and industry · American-Standard · American Blower · Church Seats & Wall Tile · Detroit Controls · Kewanee Boilers · Ross Exchangers · Sunbeam Air Conditioners

YOU can depend on KEWANEE engineering


TF
The hammer blows of fifty years have forged a golden reputation for every fitting bearing the name WeldELLS!®
TAYLOR FORGE A-181-I
WeldELLS have everything

Both hammers were the largest of their time

These two forging hammers went into service some 40 years apart, yet they boast the same claim to distinction: both were the largest in the world when they went to work for Taylor Forge. The hammer above was largest in the world of 1910. The hammer at the left is largest of its type in operation in the world of *today!*

The old hammer, now extensively rebuilt, is on well-earned semi-retirement in our Chicago plant; but it still stands as a symbol of the vigorous pioneering spirit that gave industry its first forged steel flanges on a commercial scale. It helped to forge out the first lap joint flanges for Van Stone joints. It saw the first engineered slip-on flanges; the first welding-neck flanges; the first forged welding necks and pressure-vessel nozzles; the first complete line of seamless, butt-welding fittings.

Since it struck its first blow other Taylor Forge hammers have been successively the world's largest, but "Old Number One" saw all the steps that made Taylor Forge the leader in designed piping progress.

Today's world's largest hammer in the Taylor Forge Gary Plant is eloquent proof that Taylor Forge is *still* setting the pace!

An episode in the story of Taylor Forge leadership in designed piping

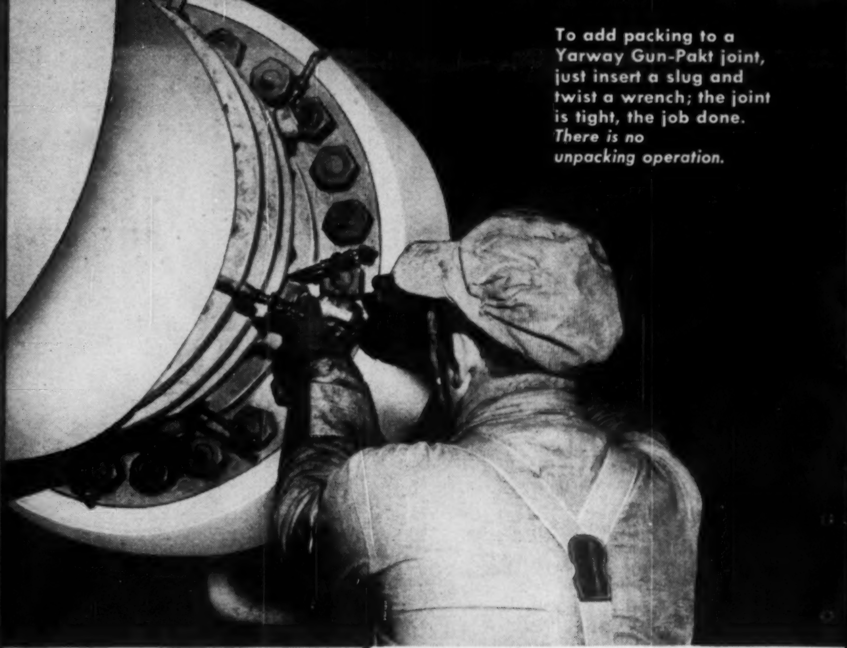
See your Taylor Forge Distributor for up-to-the-minute facts.

TAYLOR FORGE

TAYLOR FORGE & PIPE WORKS • General Offices and Works: P.O. Box 485, Chicago 90, Illinois
Offices in all principal cities • **Plants at: Carnegie, Pa.; Fontana, Calif.; Gary, Ind.; Hamilton, Ontario, Canada**

STARTLING NEW FACTS ON EXPANSION JOINT MAINTENANCE

It may cost less than you think to service expansion joints. Look at these records from three typical users of Yarway Gun-Pakt Expansion Joints:



To add packing to a Yarway Gun-Pakt joint, just insert a slug and twist a wrench; the joint is tight, the job done. *There is no unpacking operation.*

	YARWAY GUN-PAKT JOINTS	CONVENTIONAL GLAND-PACKED JOINTS
STATE UNIVERSITY*	Required addition of only 3 slugs (45 cents) of packing in 5 years. Lubrication only once every 6 months. Total labor time of only 2 manhours in 5 years.	Same lubrication as Gun-Pakt, *plus* gland tightening, *plus* complete overhaul with shutdown for unpacking and repacking every 3 to 4 years. Time for overhaul—25 manhours per joint!
MID-WEST AIRFIELD*	Only maintenance was lubrication and addition of 2 slugs (30 cents) of packing per year. Total labor ¼ manhour per joint per year.	Lubrication and gland tightening required 8 manhours per joint per year—plus complete unpacking and overhaul every 2 to 3 years. Time required for overhaul—20 manhours per joint.
"BIG TEN" UNIVERSITY*	Lubrication only once every 2 months, with packing added as needed. Total labor time charged, 1 manhour per joint per year.	General maintenance requires 6 manhours per joint per year. Complete overhaul required every 2 to 3 years with unpacking and repacking—24 manhours per joint.

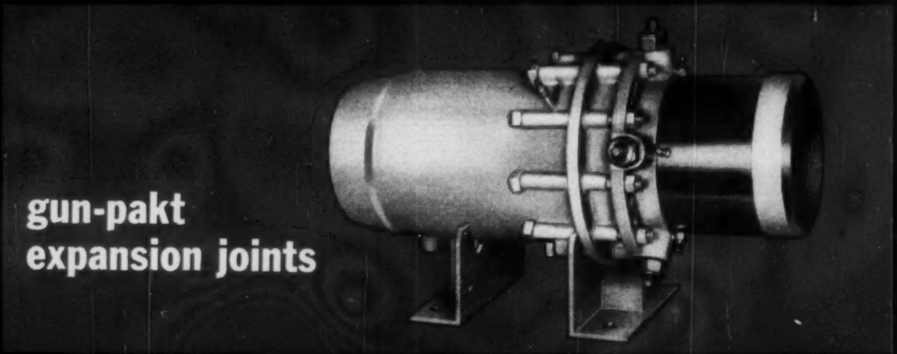
**Names on request.*

To get the full facts on Yarway Gun-Pakt Expansion Joints, and how they can save you maintenance money, write for Yarway Bulletin EJ-1913.

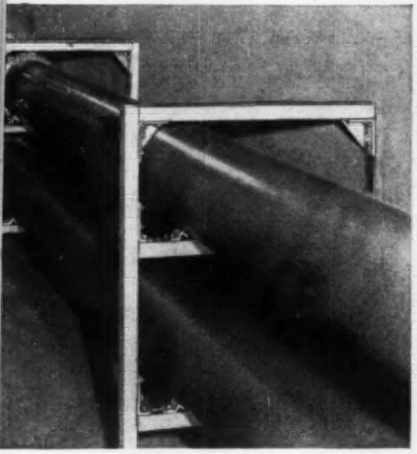
YARNALL-WARING COMPANY
107 Mermaid Ave., Philadelphia 18, Pa.

YARWAY

Yarway single-end, welding type Gun-Pakt joint for pressures to 300 psi, heavier design for higher pressures. Single-end traverses up to 12 inches; double-end up to 24 inches.



In this tunnel between two buildings, pipes of all sizes and types are supported on strong UNISTRUT framing. Exact slope and pitch are easily attained because of the adjustability of this system.



UNISTRUT framing used to rack heavy water and sludge lines at large sewage treatment plant. Note convenient UNISTRUT concrete inserts.

Frames of UNISTRUT® channel mean better pipe racking for less

Note how simply UNISTRUT framing is assembled—all you do is cut the channel to length, slip in the spring-held clamping nut and tighten with a wrench. No welding, drilling or riveting is needed with this fast pipe-racking method!

To make your work even easier, UNISTRUT framing brings you a complete *package* system—everything necessary for racks to hold heavy water lines or light conduit. Clamps, concrete inserts, hangers, rollers—all these and other accessories are stock parts of the UNISTRUT system.

Getting the exact slope or pitch is only a matter of adjustment with UNISTRUT framing. And you can stop worrying about future alterations or changes. For this unique system unbolts as simply as it goes together. Permits changes or additions at any time. You can use it again and again and never lose your original investment. .

Why not take advantage of this system on your next job? You'll find it reduces engineering detailing, installation time and gives you a better job for less money. Distributors and warehouse stocks available in all principal cities. In Canada, Northern Electric Company.

MR. STRUT SAYS:

See the new UNISTRUT film "The Sky's The Limit" and the UNISTRUT demonstrator car with all parts and uses of UNISTRUT framing.

Ask your UNISTRUT Distributor!

UNISTRUT®

U. S. Patent Numbers
2327587, 2329815, 2345650, 2363382
2380379, 2405631, 2541908
Other Patents Pending

The World's Most Flexible All-Purpose Metal Framing

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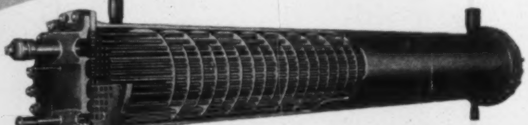
. . . the original direct expansion type liquid chiller . . . field proven in 17 years of continuous, trouble-free service . . . deliver full capacity as rated.



. . . most efficient
. . . most dependable
. . . most compact
and they're cleanable

* *or other liquids*

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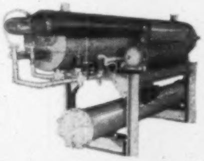
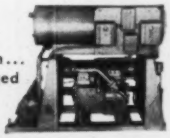
. . . simplify engineering . . . save installation time and costs . . . do a better job . . . take less space.

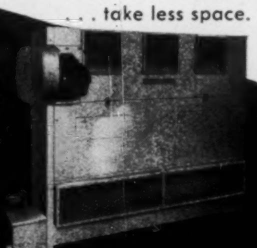


FLOW-THERM®
15 thru 275 tons



FLOW-COLD
2 thru 15 tons . . .
the original...the proven...
the most copied packaged liquid chiller.

when the problem is to
SAVE WATER
solve it with Acme



15 thru 100 tons for commercial and industrial applications

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Acme ALL-METAL COOLING TOWERS

97% water savings . . . all-metal, completely galvanized — no wood to rot, nothing to rust or corrode . . . blowers on ALL models (not propeller fans) provide correct air volume, assure quiet operation indoors or outdoors — with or without ducts . . . famous Acme wetted metal deck for fastest heat transfer, most compact size.

for top system efficiency always
USE WATER*
and specify Acme

* *still the best medium for economical heating and cooling.*

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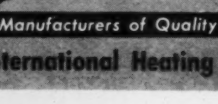
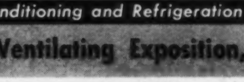
THE STANDARD OF THE INDUSTRY

Because of their pace-setting quality and superior design, Acme condensers have been preferred by leading manufacturers of air conditioning and refrigeration equipment for years. You can depend on Acme condensers to deliver full capacity as rated and give the maximum of trouble-free service.

SMALL TONNAGE CONDENSERS
with integral fin tubing

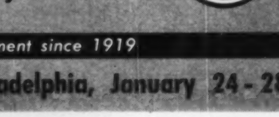


SHELL AND TUBE TYPE
½ thru 30 tons



SHELL AND COIL TYPE
¾ thru 7½ tons

LARGE TONNAGE CONDENSERS



FOR FREON
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capacities up to 300 tons

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ACME AIR CONDITIONING REFRIGERATION

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FOR WANT OF A PUMP
a plant was lost . . .
PROTECT YOUR PLANT WITH
WHEELER-ECONOMY
FIRE PUMPS

The recent series of major fire catastrophies in so-called fire-proof industrial plants has focused attention on improved fire protection methods. Most vital in the program being pressed by the insurance companies is adequate pumping pressure and water supply for fire protection.

Wheeler-Economy has devoted years to perfecting a line of Underwriter Laboratories and Factory Mutual Insurance Co. approved fire pumps.

Look into this line today . . . A Wheeler-Economy Fire Pump may save you untold losses in equipment, production and employment by being on the job with "pressure-plus" when fire breaks out.

Write for Bulletin and name of nearest Wheeler-Economy representative.

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WE-402

WHEELER-ECONOMY PUMPS

ECONOMY PUMPS, INC. · DIVISION OF C. H. WHEELER MANUFACTURING CO.
19TH AND LEHIGH, PHILADELPHIA 32, PA.

TIME-TESTED QUALITY . . .

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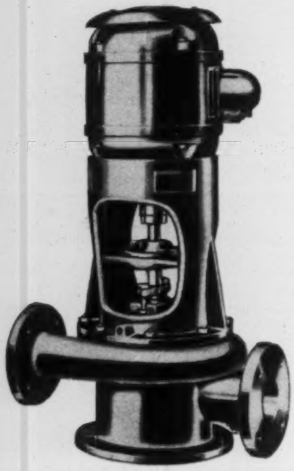
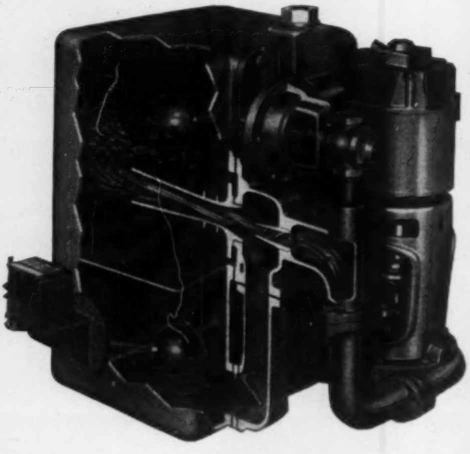
Contractors who recommend Wheeler-Economy Heating Pumps are offering standard, acceptable, equipment at moderate cost. They and the building owners and managers they serve have appreciated "Economy" since 1914. Built into the Wheeler-Economy line is forty one years of heating pump experience.

You install Wheeler-Economy with the peace of mind that you do not have to go back to a job for costly service adjustments. The low first cost, long wear and low maintenance with Wheeler-Economy Heating Pumps help you maintain your reputation for good work. Write for the latest 30 page catalog (H-1152).


TYPE SCV

TYPE VV


TYPE SCC

WHEELER-ECONOMY HOT WATER CIRCULATING PUMPS

Type SCV — Vertical direct connected centrifugal. Sizes 1 in. to 3 in. Up to 500 gpm. 1150 to 3450 rpm. Heads to 225 ft.

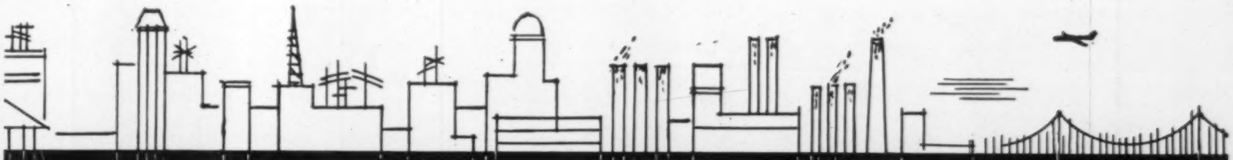
Type SCC — Close-coupled vertical or horizontal mounted. Sizes ¾" and 1¼". Up to 100 gpm. 3450 rpm. Heads to 120 ft.

WHEELER-ECONOMY VACUUM PUMPS

Type VV — Vertical. For operating between 3 and 12 inches vacuum. Discharge pressures to 150 lb. sq. in. EDR 2500 to 15,000 sq. ft. Single and duplex units. Also available in Special Capacities.

Type SVA — Horizontal. For operating between 3 and 12 inches vacuum. Discharge pressures to 150 lb. sq. in. EDR 20,000 to 100,000 sq. ft. Single and duplex units. Also available in Special Capacities.

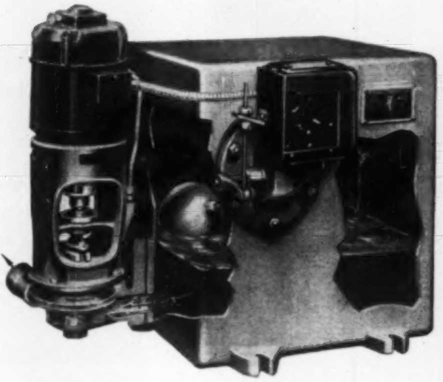
[redacted]



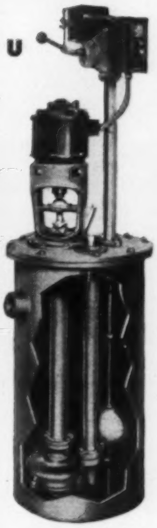
AT MODERATE COST...

HEATING PUMPS

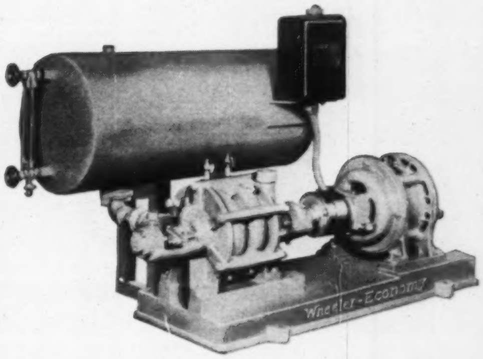
TYPE E & EC



TYPE U



TYPE B & C



WHEELER-ECONOMY RETURN CONDENSATION PUMPS

Type E — 1750 rpm. (1450 rpm at 50 cycle current). Flexible coupled. Quiet operation. Single and duplex units. Direct C.I. radiation or equivalent: 1000 to 65,000 sq. ft.

Type EC — For same or higher pressure than Type E. 3450 rpm. (2880 rpm for 50 cycle current). Direct C.I. radiation or equivalent 1000 to 65,000 sq. ft. Single and duplex units.

Type C — Multi-stage for pressures to 175 lbs. 3600 rpm 60 cycle. Identical to Type B except for higher speed operation.

Type G — Horizontal Return Condensation Pump — Single suction, single stage for medium and high pressures. 1800 to 3450 rpm.

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WE-405

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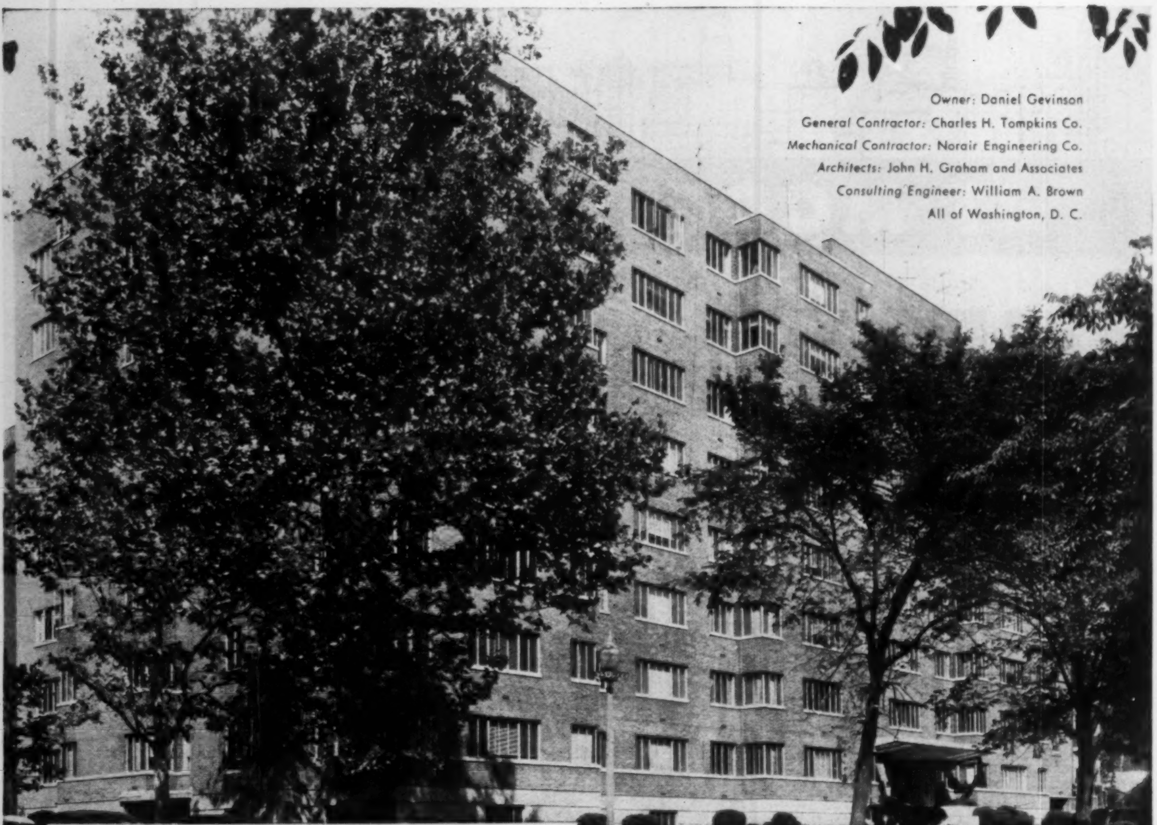
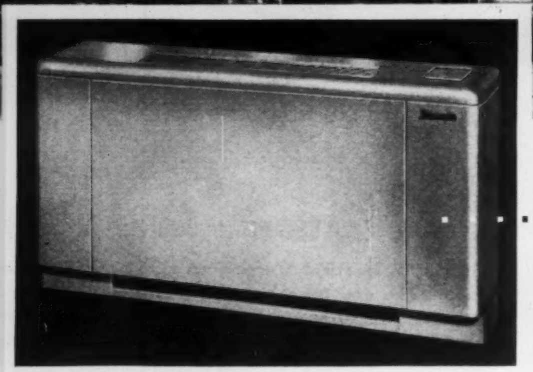


Owner: Daniel Gevinson
General Contractor: Charles H. Tompkins Co.
Mechanical Contractor: Norair Engineering Co.
Architects: John H. Graham and Associates
Consulting Engineer: William A. Brown
All of Washington, D. C.



. . . 311 MARLO "SEAZONAIRES" comfort-condition new Washington Circle Apartments

These handsome remote room air conditioning units assure dependable year-round comfort for residents of the smart new Washington Circle Apartments at 25th and K Streets, N. W., Washington, D. C.

Styled to harmonize with any interior, Marlo Seazonaires provide delightful coolness in summer, warmth in winter . . . with temperature selected by the guest.

Seazonaires are easy to install. Because of individual operation, they can be turned off when the suite is vacated. And they operate quietly, with a minimum of noise and vibration. Get the complete facts from Marlo on this modern, practical way to provide year-round air conditioned comfort for hotels, motels, office buildings and other multiple installations.

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COIL COMPANY

Manufacturers of COOLING TOWERS • EVAPORATIVE CONDENSERS • INDUSTRIAL COOLERS • AIR CONDITIONING UNITS • MULTI-ZONE UNITS • BLAST HEATING & COOLING COILS

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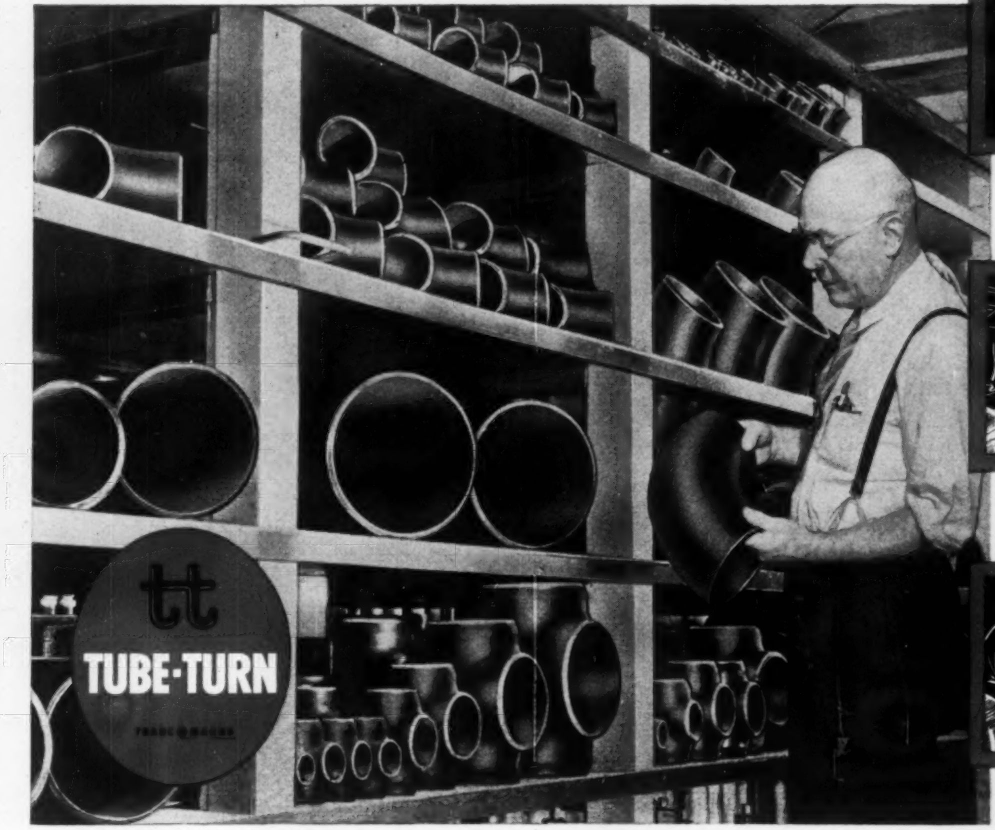
WHY IT PAYS
TO DO BUSINESS
WITH THE
LEADER



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Tube Turns' pioneering research GIVES YOU ADVANCED PRODUCTS.

TUBE TURNS' pioneering research gives you
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YOU ARE SURE to get the latest cost-saving developments in fittings and flanges when you specify "TUBE-TURN". Year after year since introducing forged welding fittings in the U. S., Tube Turns has consistently set the pace in research, quality control, development of new types, sizes and materials and in piping engineering.

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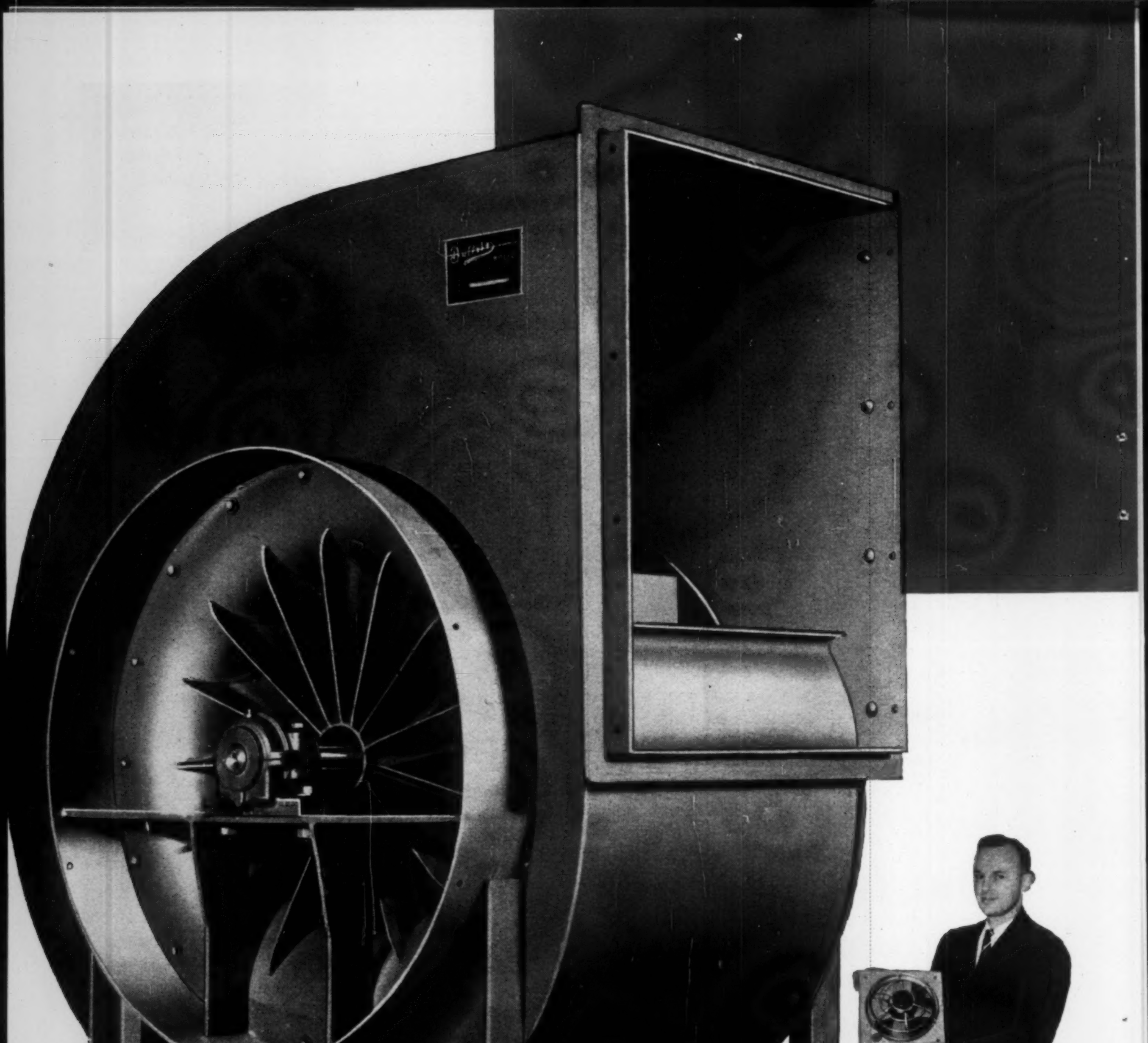
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AIR TEMPERING
INDUCED DRAFT
PRESSURE BLOWING

500,000 CFM or 500 CFM

You'll find *your* fan in the *complete* "Buffalo" line!

"Buffalo" builds ANYTHING and EVERYTHING you need in the fan and blower line. Big ventilating fans in our standard sizes deliver up to one half million cubic feet per minute, and more if required for special applications.

The smallest "Buffalo" Breezo propeller fan delivers as little as five hundred cubic feet per minute and fans of this type range in size up to 144 inches diameter.

In between these two are Industrial Exhausters — Pressure Blowers — Mechanical Draft Fans — Electric Blowers — Exhausters — Axial Flow Fans — Belted Vent Sets — Baby Vent Fans — HVA Heating and Ventilating Units — all built to the high standards of the famous "Q" Factor* which has given "Buffalo" users more for their money for 78 years.

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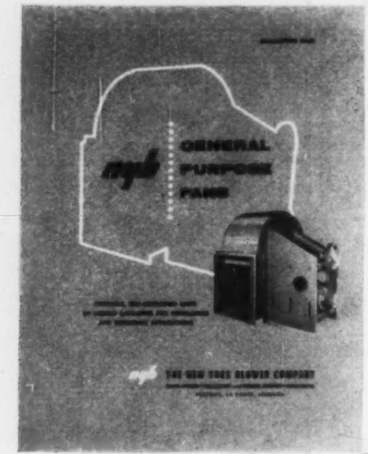
VENTILATING FORCED DRAFT COOLING HEATING EXHAUSTING


nyb GENERAL PURPOSE FANS
THE NEW YORK BLOWER COMPANY

No. 543, Standard Duty Fans
Class I and Class II
No. 544, Heavy Duty Industrial Fans
Class II and Class III
No. 545, General Purpose Fans
Portable Self-Contained Units
No. 546, Forward Curve Fans
Class I and Class II

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Certified ratings are the result of tests made by the Manufacturer in accordance with the Standard Test Code for Centrifugal, Axial, and Propeller Fans adopted jointly by the National Association of Fan Manufacturers and the American Society of Heating and Ventilating Engineers.

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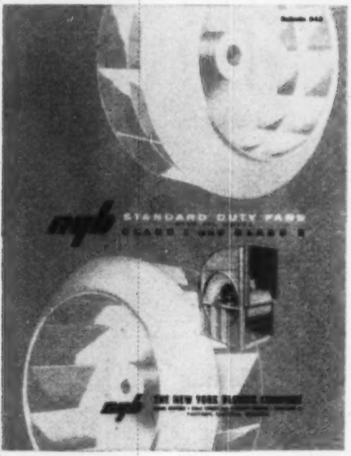
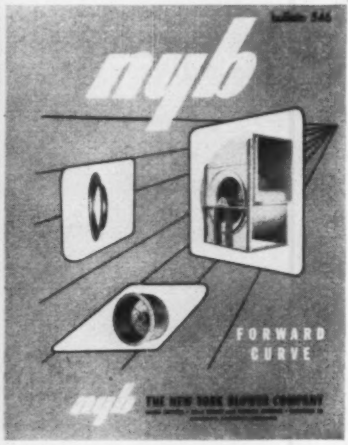

nyb STANDARD DUTY FANS CLASS I and CLASS II
THE NEW YORK BLOWER COMPANY

nyb FANS HEAVY DUTY INDUSTRIAL
CLASS II and CLASS III
THE NEW YORK BLOWER COMPANY


Bulletin 546
nyb
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HUMIDITY TROUBLE?

Yarn Lab keeps it within ±1%

"TEMPERATURE and HUMIDITY just stay the same all the time", reports a member of the yarn laboratory staff of a large, modern Textile Mill in the South. The air conditioning system was designed by The Bahnson Company and is completely Taylor controlled—within ±1% relative humidity. All of the components of the three-part TRANSET* Control System are shown opposite.

The dew point TRANSAIRE* Transmitter (shown in large picture) transmits to one of the TRI-ACT* Controllers (top picture) which regulates the three-way water valve. The mixing valve in the circulating line shunts water through, or by-passes the cooler, according to the demands of the Controller. As the dew point rises, so does the RH, thus more water goes through the cooler, and vice-versa.

The dry bulb TRANSAIRE Transmitter transmits to the other TRI-ACT Controller which regulates the reheat steam valve to keep the room at an even temperature. Its main function is to keep it from getting too cool since, when there is no load in the room, the dew point cold water slowly lowers the temperature. Constantly changing loads necessitate an extremely sensitive controller for this function, and our engineer reports that "it's doing a beautiful job, the customer's satisfaction is complete".

If close humidity and temperature control are important to you, why not call in your Taylor Field Engineer, or write for full information to Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

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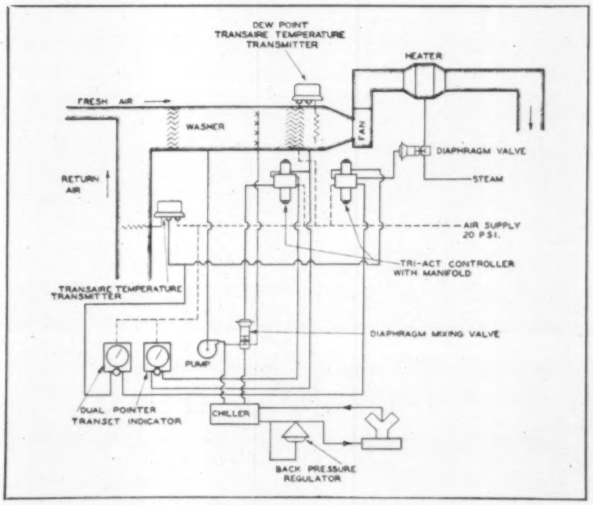
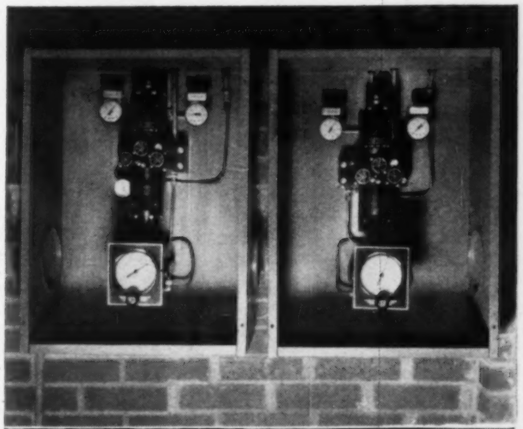
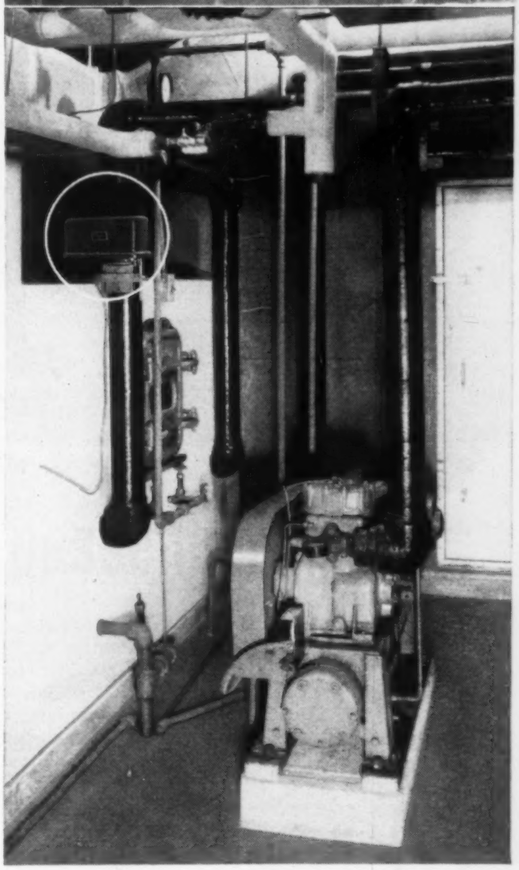

DEW POINT
TRANSAIRE TEMPERATURE
TRANSMITTER
HEATER
FRESH AIR
WASHER
FAN
DIAPHRAGM VALVE
RETURN AIR
STEAM
AIR SUPPLY
20 P.S.I.
TRI-ACT CONTROLLER
WITH MANIFOLD
TRANSAIRE TEMPERATURE
TRANSMITTER
DIAPHRAGM MIXING VALVE
PUMP
DUAL POINTER
TRANSET INDICATOR
CHILLER
BACK PRESSURE
REGULATOR

Schematic drawing of yarn laboratory humidity control.





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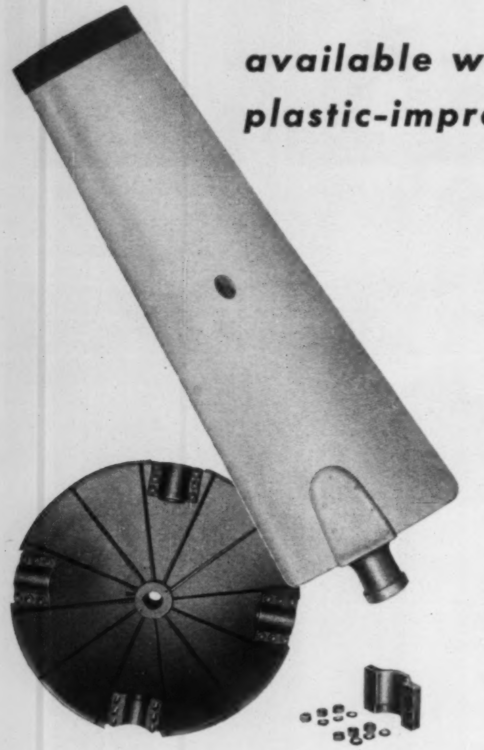
New tapered-blade design boosts efficiency, increases strength of Hartzell cooling tower fans



available with either Hartzite plastic or new plastic-impregnated laminated wood blades

Greater efficiency and increased rigidity which reduces sag to a minimum result from Hartzell's new tapered-blade design. Blades now used on all cooling tower and heat exchanger fans in 14 to 22 foot diameters are considerably thicker at the shank than at the tip. Further strength and rigidity is provided by a rib-like reinforcement along the leading edge of the blade.

Two types of blades are available in the new design — Hartzite plastic blades as on the older designs and new plastic-impregnated wood blades.

For maximum durability and length of life, Hartzite plastic blades should be used. Fabric-reinforced Hartzite has been proved in thousands of installations since 1941 as the blade material most resistant to corrosion, vibration and abrasion. However, the new plastic-impregnated wood blades show remarkable resistance to deterioration and their initial cost will be less than that of Hartzite blades.

Both blades are of laminated construction. Hartzite blades are laminated of cured plastic sheets, and the new wood blades of 1/16" maple or birch impregnated with a special resin and covered with a plastic-setting coating. The leading edge of the wood blades is covered with an aircraft-type neoprene boot to increase resistance to abrasion.

Taper is achieved by reducing the number of laminations. A blade from a 14 foot assembly tapers from 1½" (14 laminations) at the shank to ¼" (3 laminations) at the tip.

For complete details on these rugged new fans, write today for your free copy of Bulletin A-111A.

This cross section cut from a laminated Hartzite plastic blade shows the heavy reinforcing rib along the leading edge.

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Div. of Castle Hills Corp.

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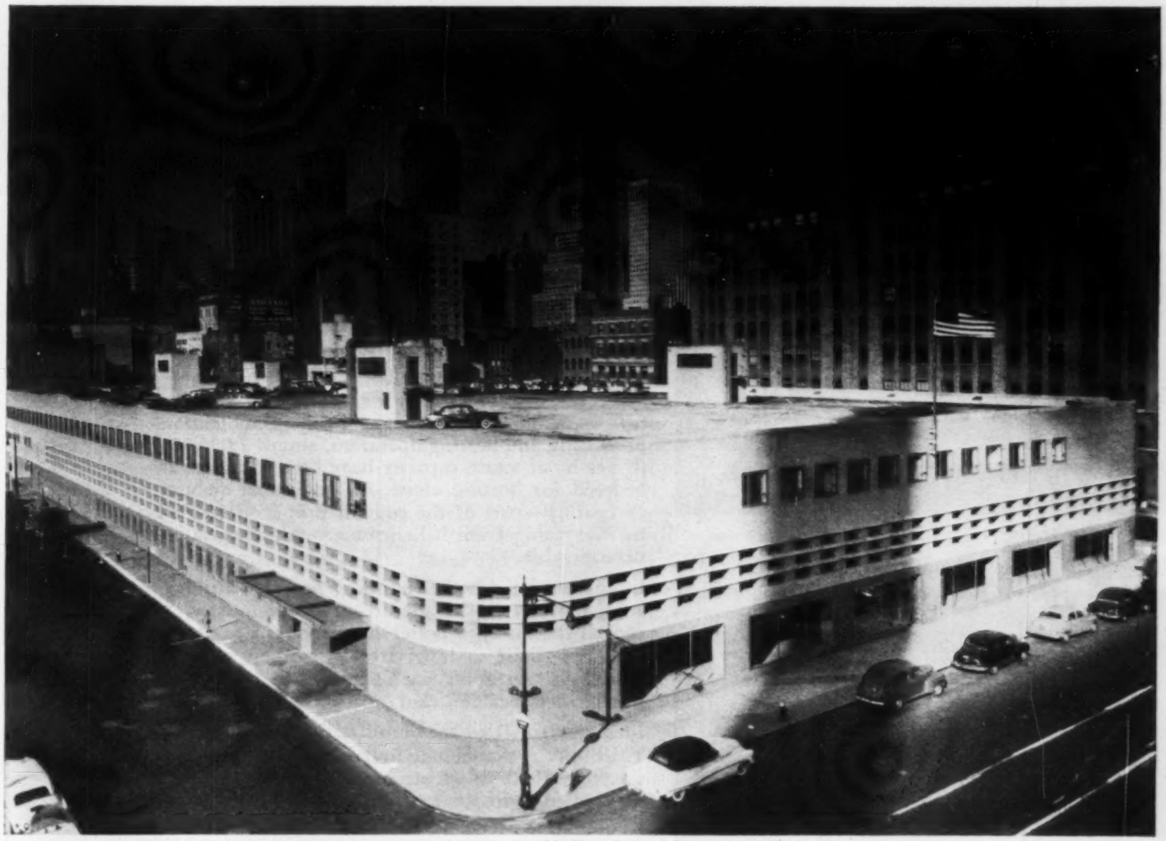

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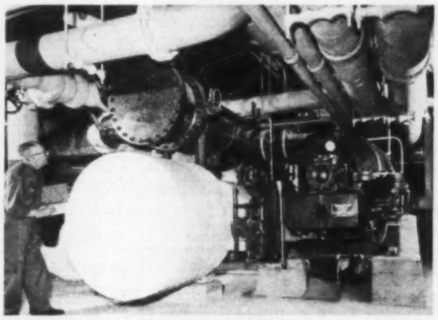

CHILLED WATER to air condition new airline terminal is supplied by this efficient Worthington centrifugal refrigeration unit.

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The joint enterprise of 23 leading airlines, the new terminal now serves over 35,000 people a day.

And for this modern building, nothing less than a truly modern air conditioning system would do. That's where Worthington came in. A Worthington-engineered, Worthington-built 315-ton centrifugal refrigeration system, along with Worthington air handling equipment and pumps, carries the entire cooling load for the terminal's 3,300,000 cubic feet of space.

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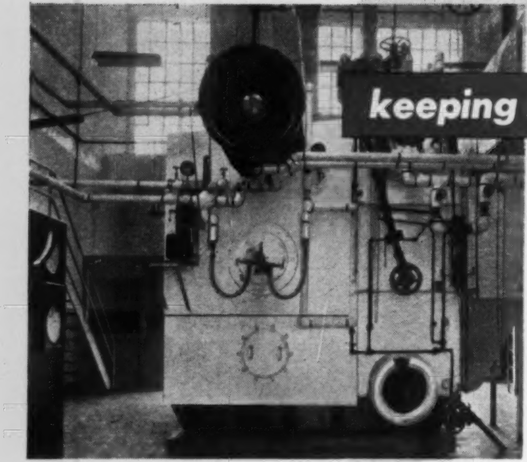

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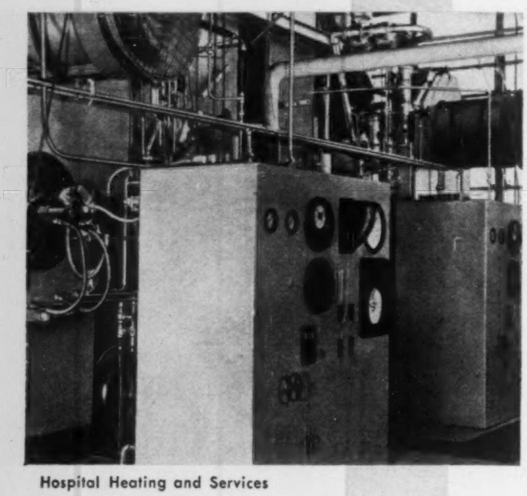
Reflecting wide acceptance with users in almost every category in addition to heating, the B&W Type FM Boiler is now in service or on order for a total steam capacity of well over 9,000,000 lb per hr. Bulletin G-76A will give you details. The Babcock & Wilcox Company, Boiler Division, 161 East 42nd Street, New York 17, N. Y.



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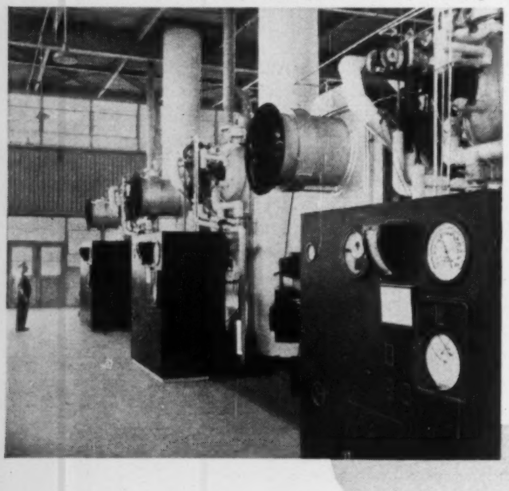

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G-683

THE EDITORS' PAGES

How Much Business in '55?

• *How does the year's general economic forecast compare specifically with the outlook for the heating, piping and air conditioning field? Here are the supported predictions from leading sections of this field. Together, they indicate a higher increase in business volume for this field than for the economy as a whole in 1955.*

AROUND THIS TIME each year everybody turns economist and tries to predict what the trend and volume of business will be in the new year. As usual, there is no lack of crystal gazing this year. Starting as far back as last September, the government and others have been amassing, sorting, interpreting, and forecasting predictions for 1955 by the cubic yard.

Doing some sifting ourselves, HPAC has come up with some specific expectations with significance for heating, piping and air conditioning in 1955.

Heating Fires Up in '55

For example, in heating, the steel boiler industry, which has undergone "normal" expansion during the past year, sees a bright prospect for a continuing volume of business in 1955. This is due chiefly, says the Steel Boiler Institute, to the large building program. SBI's president, R. A. Locke, reports that the industry ended up the year 1954 with shipments equal to 99 percent of the shipments in 1953. Residential boilers and low pressure commercial heating boilers exceeded 1953 shipments. However, the high pressure boiler shipments were somewhat less.

It is also good to hear from the Institute of Boiler and Radiator Manufacturers that the volume of shipments of cast iron boilers during 1954 showed a 5 percent increase over 1953. Furthermore, the IBR feels that 1955 will show a "healthy" increase over 1954 and bases this prediction on the high level of construction and the increasing demand for modernization work. "The hot water and steam heating industry," says R. E. Ferry, general manager of IBR, "is in an increasingly improving situation as far as new heating installations are concerned." He credits this in large measure to the "phenomenal increase in the use of the baseboard type of radiation."

The Stoker Manufacturers' Association also took a look into the crystal ball for 1955 but saw "a picture almost as confused as the past year." According to President L. C. Dubs, the SMA believes that "some industries will enjoy considerable prosperity, while others of a normally sound nature will have rough going." He feels that business in general has hit the bottom of the down trend and goes along with the estimate that business for 1955 will be about the same as the last half of 1954, with some chance for a slight improvement — up to 5 percent on the average.

But for the stoker industry, the association feels that the outlook is perhaps more confused than for many other industries, "since our future is so closely tied up with the demand for coal in commercial and medium industrial installations." Nevertheless, Mr. Dubs expects the coal industry to do better in 1955 and believes the stoker industry will gain some additional business also. One reason for this is the fact that stoker manufacturers are now offering complete package units for the boiler plant, including not only stokers, but conveyors, combustion control systems, and smoke control systems, he says.

The Oil-Heat Institute of America forecasts a fine year for the commercial-industrial oil heating industry in modernization and replacement of equipment that is now obsolete or worn out, as well as in new construction. The OHI calls attention to the literally thousands of boiler rooms across the country that are antiquated.

R. H. L. Becker, managing director of the OHI, states that "the costs of maintenance, service and operation of this obsolete equipment runs so high in many cases that full replacement would save users millions of dollars annually." The improvement in equipment, modern design and the increased technical knowledge of the past few years, he feels, will contribute to a bigger volume of business in 1955. In fact, Mr. Becker estimates a 10 percent increase in dollar volume in this field in 1955.

The OHI estimates that new commercial building will go up to $2.3 billion dollars in 1955, or 7 percent above 1954, which showed about a 25 percent gain over 1953. This is based on the migration to the suburbs and the tremendous road building programs, which will in turn bring vast new building along these new highways. The OHI expects school building to increase by 16 percent over 1954; hospitals and similar institutions to go up by 14 percent; churches and other institutions up 15 percent; and new military bases up 18 percent over 1954, which showed a drop of 28 percent from 1953. On the other hand, the OHI expects industrial and public housing volume to drop in 1955 from the 1954 volume — anywhere from 2 percent to 33 percent, depending upon the many categories included in these groups.

The American Gas Association expects overall sales of the gas industry by 1957 to increase 25 percent above sales in 1954, a gain of 32 percent over 1953 sales of gas. The association expects that gas heating requirements in 1957 will be above 53 percent higher than those in 1953. To meet the increased demands, says President F. M. Banks, the gas industry will need 4.6 million tons of steel pipe between now and the end of 1957. About 2.9 million tons will be of 16 in. diameter or over, primarily for gas transmission lines. Sales of gas in 1954 totaled $3,013,000,000 or 10.8 percent more than 1953. The industry is set for a boom, with newly discovered and proved recoverable reserves of natural gas, an added 18,000 miles of pipe line, continuing construction and expansion of plant, and a record number of customers. New customers are being added to gas utility mains at a rate of nearly 800,000 a year.

Piping To Progress

Despite the high rate of construction during 1954, shipments of standard pipe for the first nine months last year were 20 percent under 1953's volume. But George D. Lain, research engineer for the Committee on Steel Pipe Research, is somewhat more optimistic for 1955. It is his opinion that standard pipe shipments will be from 5 to 8 percent higher this year, due mainly to the anticipated continuation of a high volume of construction and the fact that inventory reductions were practically completed during the first half of 1954.

The outlook for the use of plastics in piping is an interesting one, says Langdon P. Williams, of the Society of the Plastics Industry. However, he has no economic forecasts to make at this time.

As for brass mill products, a big year is seen in the building field, reports T. E. Veltfort, manager of the Copper & Brass Research Association. All the indicated progress in commercial, institutional and residential building assures, he says, "the continuance of remarkable advances in the heating, piping and air conditioning field." He sees control of year 'round internal climate rapidly becoming an indispensable requirement, and forecasts an even wider acceptance of large residential and individual home air conditioning.

Air Conditioning To Grow

Harry C. Ballman, executive secretary of the Air Pollution Control Association, predicts for 1955 more and more regulation to control air pollution, which in turn will bring about advances in instrumentation to determine such air pollution and better designs for equipment to control it. And the effects of all of this, he believes, are two-fold: "(1) A cleaner air over all metropolitan areas, which may possibly reduce the maintenance and costs on air conditioning equipment. In particular, filters will not have to be replaced so often. (2) Cleaner outside atmosphere has the tendency to cause people to think in terms of cleaner internal atmospheric conditions, which should be reflected in their greater acceptance of air conditioning equipment."

George S. Jones, Jr., managing director of the Air-Conditioning and Refrigeration Institute, sums up 1954 as a record year in all phases of air conditioning. He predicts that air conditioning will play a very important role in 1955, not only in new construction but also in existing construction.

Three areas seem to Mr. Jones to need very close attention: "(1) Improved design toward the end that improved performance and lowered cost will make a further penetration in the mass market. (2) A more aggressive industry-wide effort directed toward development of equipment that would bring summer cooling to the residential structures using hot water or steam. (3) A great deal of education along the line of application engineering to see that air conditioning is properly specified and installed."

Also calling attention to improved design and performance of air conditioning equipment is the Cooling Tower Institute. Raymond C. Kelly, executive manager, believes that the use of various new materials for tower construction will continue to increase as building codes and fire ordinances are revised to accommodate roof level installations in metropolitan areas. He predicts that improved cooling tower designs, particularly in the smaller size towers, will give greater latitude in tower-site choices.

Air conditioning is described as America's fastest growing industry at the present time, with "almost inexhaustible markets still barely scratched," by John A. Gilbreath, manager of the Westinghouse air conditioning division, who forecasts that sales of air conditioners for commercial, industrial and residential use will soar 1000 percent in the next 10 years. In the residential market alone, he predicts, 50 percent of the new homes to be built within the next decade will have central air conditioning.

Put all these forecasts together and you realize what a big year is in store for heating, piping and air conditioning in 1955.

"Quote"

"The conservative estimates made for new construction likely to be undertaken in 1955, if approximately realized, would represent only a small fraction of the nation's potential long range construction market."—Thomas S. Holden, vice chairman of F. W. Dodge Corp.

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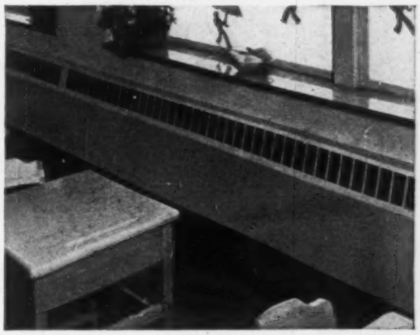
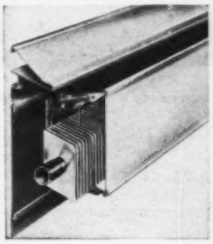
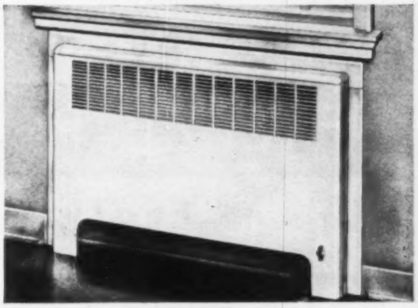


Webster Baseboard Heating



Webster Gas Unit Heater

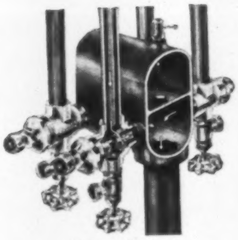
Webster Convector



Webster Hot Water Heating Equipment

Floor Cover Plate

Tru-Perimeter Expansion Joint



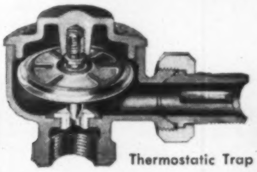
Purge Header

Pressure Relief Valve

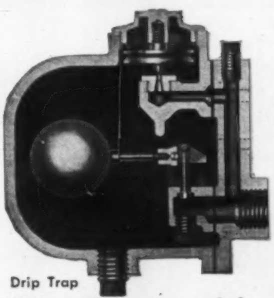
Pressure-Reducing Valve

Flow Control Valve

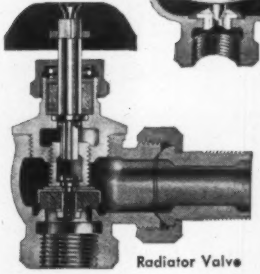
Webster Steam Heating Equipment



Thermostatic Trap

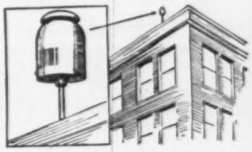


Drip Trap



Radiator Valve

Webster Steam Heating Equipment includes a complete line of radiator traps and valves, process steam traps, dirt strainers, lift fittings, expansion joints.



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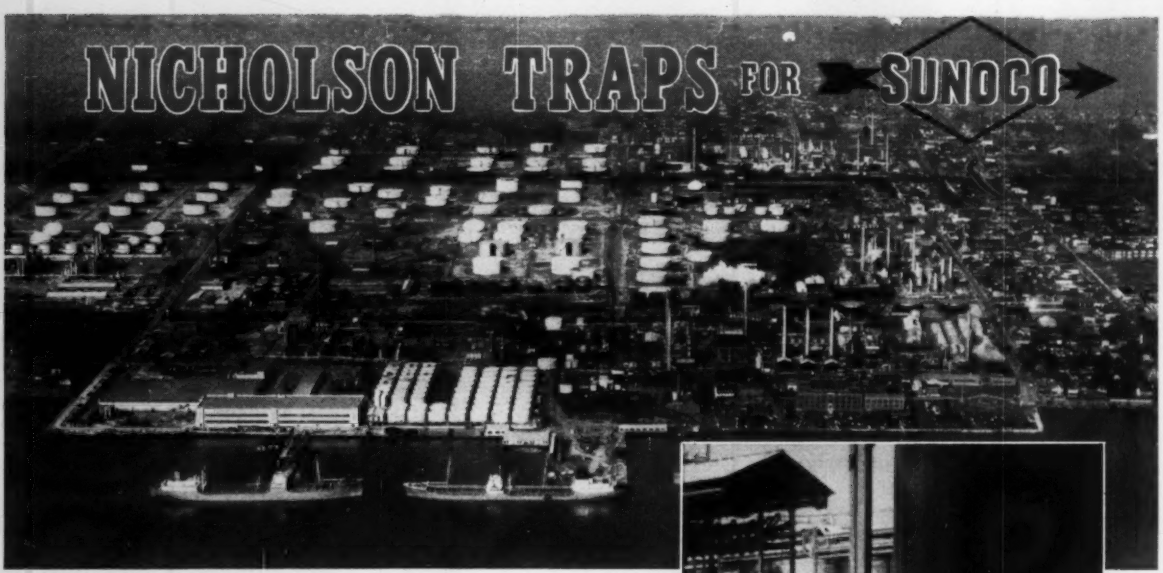
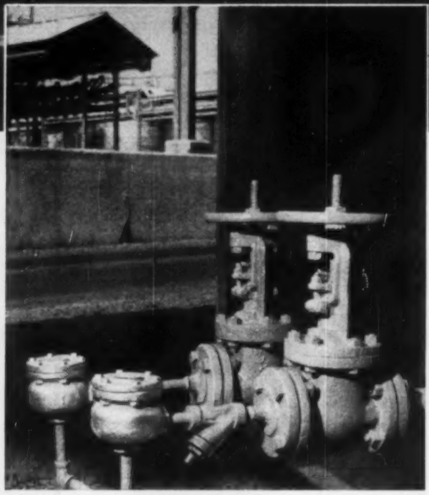
Webster Heating System Controls

Continuous Flow Control for Hot Water Heating
"Controlled-by-the-Weather" Moderator Systems of Steam Heating
Main Steam Control Valves
Zone and Radiator Shut-Off Valves

SEE THE WEBSTER NEW PRODUCTS DISPLAY AT THE HEATING AND VENTILATING EXPOSITION, JAN. 24-28

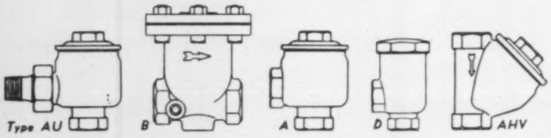

NICHOLSON TRAPS FOR SUNOCO

Air view of Sun Oil Company's refinery at Marcus Hook, Penna.



Nicholson steam traps are shown above installed on storage tanks requiring heating at Sun Oil Company's Marcus Hook, Pa., refinery. Sun has standardized on this type of installation.

Standard for
OUTDOOR USE
Due to
FREEZE-PROOF
Feature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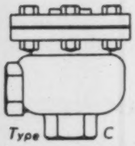

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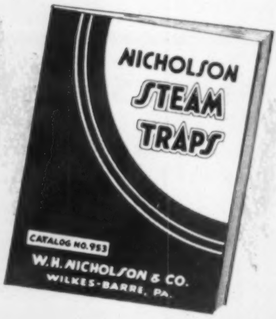
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- *WE FOLLOW HERE each month the practice at engineering society meetings of providing an "open for discussion" period. You are urged to take part. Just address your comments to the Editors, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2.*

"Modify HTHW Practice for U.S. Use"

THE ARTICLES by S. A. Kuli on high temperature hot water systems, in the January and February 1954 HPAC's, and subsequent comments in HPAC on them have been most interesting. I would like to add a few details about the development of HTHW and, in particular, to qualify certain practices in its applications for American use.

I have installed HTHW heating plants in England, mainly in the industrial field, applicable mostly to textiles. HTHW arrived in England in the late '20's from the Continent, and has gained steadily in popularity, making rapid progress in later years. A great deal of technical knowledge has been gained, but little of this has been published.

In Mr. Kuli's articles, I found no evidence that the return connection to the boiler should be at the bottom of the boiler. However, in my experience, I have found this to be the practice, so as to prevent short-cutting across the top layer of water. The cross section of a HTHW boiler and its connected piping is shown in Fig. 1.

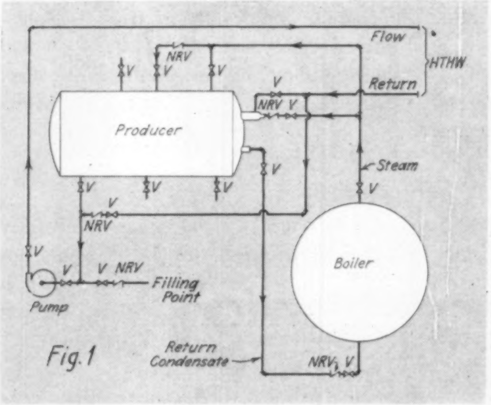


Fig. 1

Another point not mentioned in Mr. Kuli's articles and the comments that have followed is the means of assessing the lowest permissible water level. This is most important, and is based on the highest heating surface, which will have water on one side, and flame or flue gases on the other. The lowest permissible water level is found by allowing 1 in. of water over this surface. This level should be indicated on the gage glass in front of the boiler and should be watched carefully by the operator, and make-up water should be added if the level shows signs of falling.

Where the connections are to be made to an overhead drum, a bottom take-off connection can be made, and as a precaution, the branch can project into the drum about 3 in., so that if there be any sludge, it is not drawn down and circulated in the system. This also obviates a potential air lock, should a top connection be made.

Mr. Kuli also mentions deaeration equipment in his February article. This practice has also been observed in the American military authorities' specifications. It is my opinion that there is no need for this equipment to be installed in any HTHW heating system, since a continuous boiler feed is not maintained and only very small quantities of water are added at infrequent intervals. When a system is first filled with water, all that is required after reaching full heat for the first time is to manually vent all the high places, as in an ordinary heating plant, since the application of heat expels the air from the water.

A water treatment plant also is not an absolute necessity for every system. In many instances this can be omitted, but it is wise to have a sample of the local water analyzed before deciding on water treatment. Should temporary hardness be indicated, an ordinary blowdown to the boiler will be good enough, and the amount of water treatment should be assessed against the number of times the water will be changed in the plant.

Another HTHW development which may be of interest is the use of a boiler to produce steam and HTHW at the same time. This is accomplished by means of a producer, shown in Fig. 2. The diagrammatic piping arrangment is shown in Fig. 1. This arrangement has been used where impurities are excessive and frequent blowdown has been necessary. In no case was sludge carried over to the HTHW side of the system.

To assist the engineer in designing HTHW systems, the following information is offered as a guide.

The usual flow velocity for mains is 6 fps and for branches it is 3 to 4 fps, while velocities as low as 1 fps can be used through the apparatus. The pressure which has been found to be most economical in

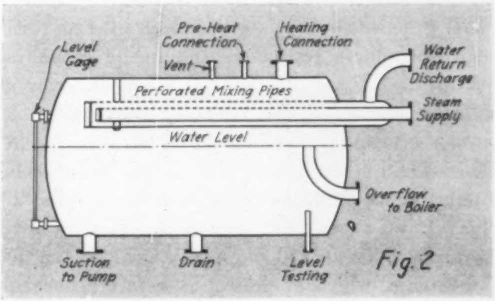


Fig. 2

my experience is 120 psi. This gives a water temperature of 350 F.

In determining pipe sizes, it would be advisable not to use any European charts on HTHW for an American system. I would suggest that the Fanning formula be used, and to help simplify this, the information in Table 1 is offered.

TABLE 1

Pressure, psi	Water temperature, F	Btu factor	Viscosity, centipoises	Density, lb per cu ft	Weight lb per cu ft
100	338	309	0.167	56.00	8.972
110	344	316	0.164	55.79	8.96
115	347	319	0.162	55.68	8.918
120	350	322	0.160	55.57	8.9
125	353	325	0.159	55.47	8.882
130	356	328	0.158	55.37	8.864

In planning the piping, long radius bends not less than three times the pipe radius are recommended as giving better results. Mitres and sharp elbows are not recommended. Branches should be taken into the mains at angles between 30 and 45 deg. No square tees are permissible, even with tongues. Valves should be of the parallel slide type, with long stuffing boxes and external threads. Non-return valves should be vertical lift type with piston style dashpot, in my opinion. The pump should have long glands with lantern ring and integral water cooling facilities. However, pumps are now available which have no gland.

Practically any boiler can be adapted for use on HTHW, providing that the HTHW pressure is within the limitations of the design pressure.—HARRY HALLWOOD, Staff Engineer, The Ric-wiL Co.

"Why Not *R* Value Instead of *U* Value?"

THE ANSWERS to the question, "*What's the 'U' Value?*," in the November and December 1954 HPAC's, are all satisfactorily stated. Unfortunately, two of them may be considered somewhat out-of-date since the publication of Housing Research Paper No. 32, "The Thermal Insulating Value of Air Spaces," by the Housing and Home Finance Agency.

This paper, based on tests at the National Bureau of Standards, provides a series of graphs and formulas by which the thermal conductance, C, of an air space can be found. Its resistance, $1/C$, is easily added to all the other resistances in the assembly to find the total. Then the "U" value is of course the reciprocal.

This practice of converting conductance to resistance, then adding resistances and finally converting back to the "U" value is familiar to all. But why do we make so much trouble for ourselves? Why not consider a material in terms of its resistivity — "R" value — and resistance? Why not rate an assembly in terms of its air-to-air resistance instead of its "U" value? May I suggest that this simpler practice might be welcomed if we had a simple name for the unit of resistance, which at present is a rather unwieldy expression? What's a good name?—F. A. JOY, Professor of Engineering Research, The Pennsylvania State University.

"How Are Units Controlled?"

I WISH TO COMMENT on Winston R. Kelley's scheme for heating the Eastport school in Michigan City, Ind. — *Forced Hot Water Heats New School 5 Ways*, published in the November HPAC — especially as I have designed many new mechanically ventilated schools in Columbus and Toledo, Ohio, using forced circulation hot water.

Unless some especially high quality No. 5 oil is available, however, I would be conservative about its being *cold*. This fuel seems always to be more acceptable when it is warmed.

Also, it seems to me that there is a typographical error in the article concerning the classroom ventilators. It may be that Mr. Kelley meant to say that all classrooms are served by a separate hot water circuit that has at its start a three-way mixing valve. This valve selects more or less hot water from the boiler with corresponding volumes of less hot water returning from the radiation. I think he also meant to explain that one thermostat in the air stream of each unit ventilating machine controls a valve on the heating element in the machine, while a separate thermostat on the wall of the room controls the valves on the auxiliary radiators in each room. I would like to know whether the three-way mixing valve control of those hot water heating elements that are exposed to entering sub-freezing air results in frost damage. I have used boiler water temperature water in such elements, limiting the mixing valve water to the direct radiators.—SAMUEL R. LEWIS, Consulting Mechanical Engineer.

THE AUTHOR'S REPLY —

THE NO. 5 OIL referred to in my article is a heavy oil not requiring preheating devices. I would also like to refer to the article, *Use Light or Heavy Oil?*, by R. I. Anderson, in the April 1954 HPAC on this subject, where Mr. Anderson cites his experiences with heavy oil in heating schools.

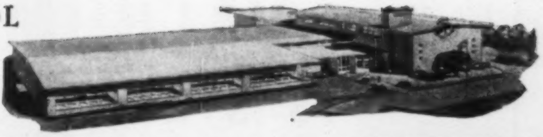
Concerning the mixing valves, there is no typographical error. Each unit has its own three-way mixing valve. A thermostat on the wall of the room controls this valve as well as the window radiation valve.

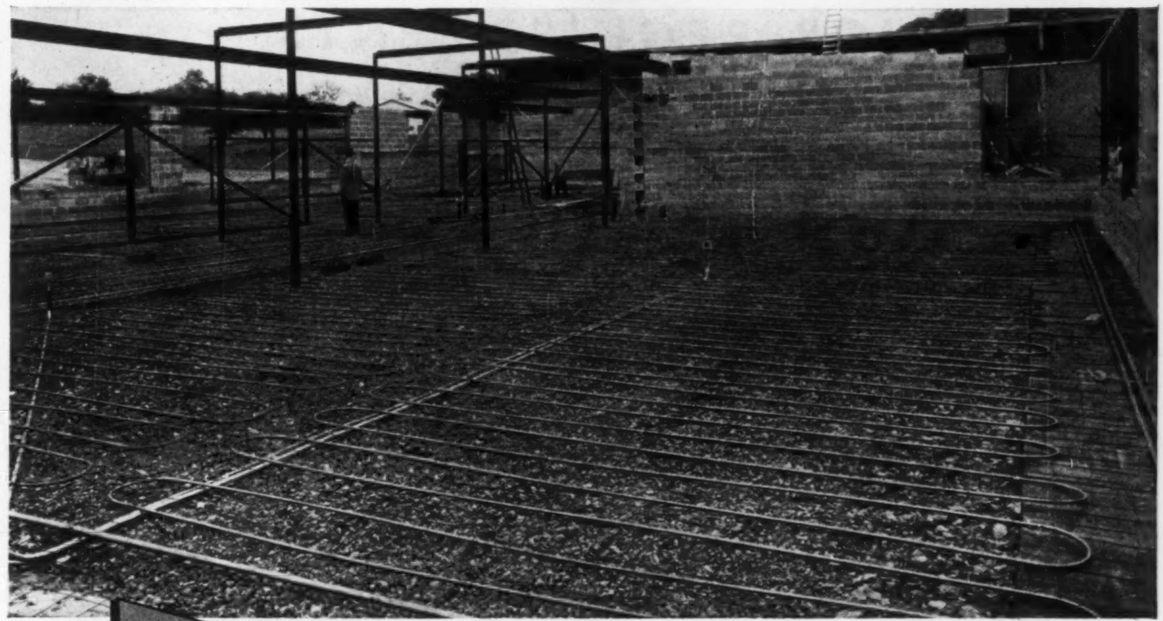
The unit ventilator manufacturers have spent considerable time and money for research on the coil freezing question. Their findings indicate that the possibility of coil freezing with the controls used today are very remote. A steam coil would freeze also if exposed to the same chain of events that are required for hot water coil freeze-up.—WINSTON R. KELLEY, Vice President, Eddy Isbey, Inc., Contractors & Engineers.

MANCHESTER ELEMENTARY SCHOOL

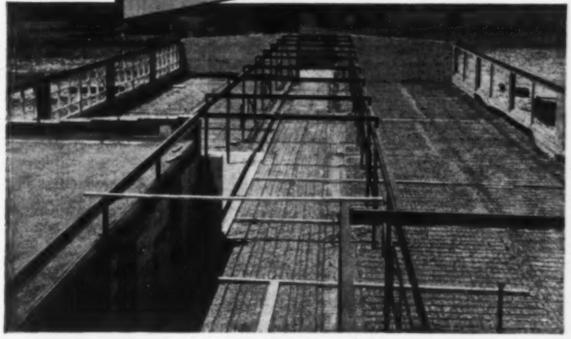
Manchester, Missouri

Architect: CHARLES W. LORENZ, Kirkwood, Mo.
Contractor: JUENGEL CONST. CO., St. Louis, Mo.
Radiant Heating: BAGLEY & COMPANY, Inc., Robertson, Mo.
Revere Distributor: GRINNELL COMPANY, Inc., St. Louis, Mo.





Another case of COPPER where it counts!



TWO VIEWS of the radiant Panel heating layout before concrete slab was poured. Floor area over 17,000 sq. ft. System was imbedded in slab 4". Gravel fill is 6" deep. Coils are 12" OC. System is divided into 4 zones, with all supply and return lines also of copper. Note edge insulation at right in large photo.

Radiant Panel Heating fits perfectly into the growing trend to 1-story school construction. It means warm floors, no drafts, and a healthier atmosphere for scholars. To the architect radiant panel heating means greater latitude in design, more usable space for the money. And for the user it means greater heating efficiency, lower redecorating costs and less cleaning and maintenance than when old-fashioned heating methods are used. The ideal material for panel heating is copper. For no other metal or alloy has all the desirable construction characteristics of this "ageless" metal.

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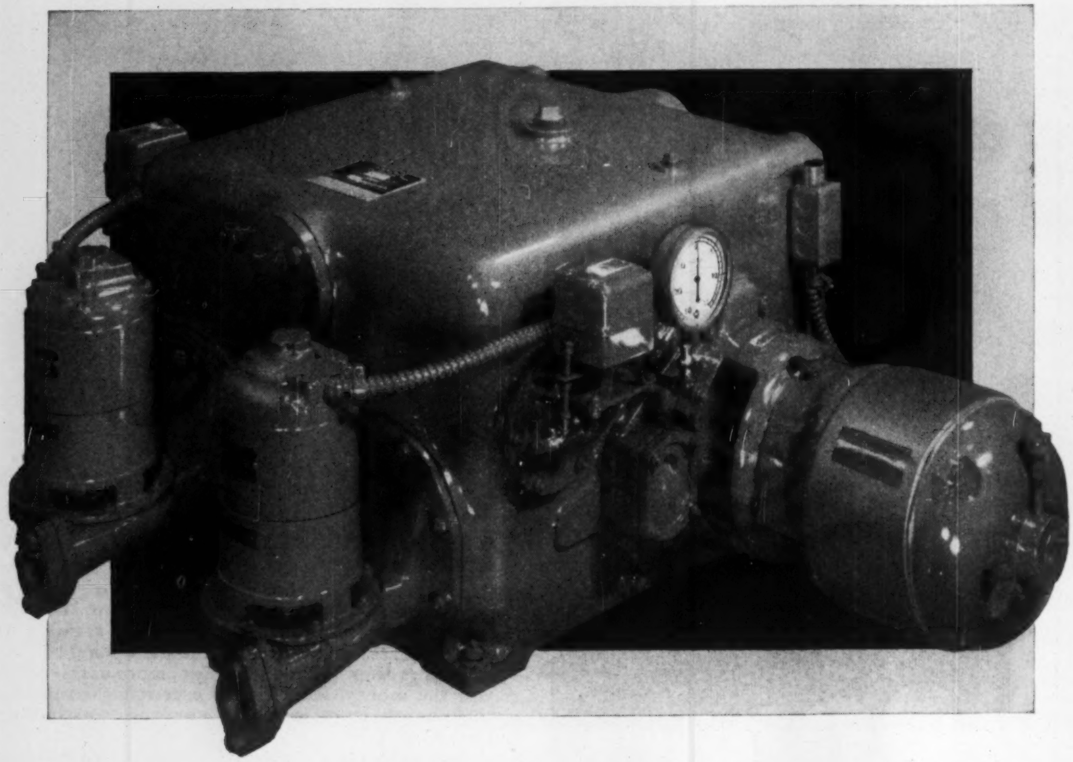
THIS NEW VACUUM HEATING PUMP IS SIZED TO ACTUAL JOB REQUIREMENTS



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No longer is it necessary for the Engineer to accept a vacuum heating pump with air and water capacities based inflexibly upon square feet of equivalent direct radiation. With the flexible Nash CSM he can provide for proper air capacity in accordance with his judgment and experience. For the individual capacities of the separate pumps on the CSM may be varied within a wide range, without buying an oversize receiver and oversize water pumps.

These pumps possess many other features which permit a more efficient utilization of fuel and minimum use of electric power. Low, low, returns reduce installation costs and usually eliminate putting the pump in a pit. Simplicity and efficient operation reduce supervision and maintenance costs. Information regarding this new heating pump development is available immediately upon request.

- ✓ **Increased air capacity induces rapid system response without wasteful overheating.**
- ✓ **Separate air and water pumps individually selected to meet actual job requirements.**
- ✓ **Control system that operates individual pumps only when needed.**
- ✓ **Flexibility permitting addition of radiation without changing basic pump installation.**
- ✓ **Low, low, return line connection.**

NASH ENGINEERING COMPANY
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1 THE PRIMARY air conduits and secondary water services for the window cabinet units were installed during hours of occupancy with minimum disturbance to tenants

Office Building Keeps Pace — Installs Complete Air Conditioning

By James Bricker

Staff Engineer,
Charles S. Leopold,
Consulting Engineer

• There was no loss in rentable space as a result of the installation of this high pressure perimeter and low pressure interior zone air conditioning system in one of Philadelphia's leading office buildings. The entire project was completed in nine months, with most of the work performed during normal working hours. The consulting engineer, Charles S. Leopold, is a member of HPAC's board of consulting and contributing editors.

THE FIDELITY-PHILADELPHIA Trust building was completed in 1928 and is in downtown Philadelphia. Towering 30 stories above the street some 377 ft, and with a net floor area of 600,000 sq ft, the building is of steel frame construction with brick exterior walls faced with limestone above a granite base. The foundations extend below the street for three levels of basements where the bank vaults, utility rooms and service facilities are located. At the street level the building is 220 ft by 175 ft and above the fifth floor level the center portion of the building sets back to form a shape like the letter H. The

2 TYPICAL WINDOW CABINET unit installation. Center pilaster contains the primary air conduits and secondary water piping services for the units

3 INTERIOR ZONE supply ducts are closed in with metal lath and plaster from top of duct to furred ceiling. Duct is streamlined and outlets are flush mounted

first six floors are occupied principally by the Fidelity-Philadelphia Trust Co. The upper floors are rentable office areas.

Prior to 1953, various tenants in the building installed approximately 200 console type air conditioning units as an expedient solution for comfort in the hot and humid summers. The management would not permit the use of air conditioning units of the type installed within the window frame at sill level because it was felt that the appearance of the building would be marred by units projecting beyond the outside walls. In addition, the Trust Co. installed console type and other similar units in many of the office areas occupied by the bank. Providing power, water drainage and general maintenance for these units scattered throughout the building created problems of planning and arranging for such services. To eliminate these problems, and with the apparent general acceptance of air conditioning by the tenants, the directors of the building decided to provide year 'round air conditioning for the entire building. In so doing, they would continue to maintain an efficient office building.

As the architect was originally faced with a problem of designing a structure which would be efficient both as banking and rentable space, the air conditioning engineers were faced with a similar situation. In our planning of the air conditioning design for the main banking space, it was important that we accomplish the desired result without destroying the architectural features. In the rental areas the problem was to maintain the architectural appearance and to provide in the design for flexibility of office partitioning with little or no change in the air conditioning system.

Before arriving at a recommendation as to a particular system to be installed for the rentable areas, seven methods were studied. These plans, varying as to loss of rentable area, appearance, life of equipment, maintenance, and disturbance to the tenants during installation, were all based on a comparable end result to control temperature, humidity, odor level, and air cleanliness, with the minimum loss of rentable area. All methods included individual temperature control for the perimeter offices and zone control for the interior spaces where the cooling problem is the same in winter and summer.

Perimeter and Interior Systems

The method recommended and installed is, in effect, two different systems, one for the interior zone and one for the perimeter or exterior zone. The perimeter system was designed for high pressure air distribution and the interior system for low pressure air distribution. In general, any area separated from the window or exterior wall by a partition or more than 19 ft from the exterior wall was considered an interior area or zone.

To provide space for the air handling equipment for the high and low pressure systems, two penthouses were erected on the 29th floor roof, one on the north wing, and one on the south.

Conditioning equipment for three high pressure perimeter systems is installed in the north penthouse for the north wing and for the center perimeter of the building and in the south penthouse for the south wing. In the direction of air flow each apparatus consists of outdoor air intake louvers and automatic outdoor air dampers, preheater coils, electrostatic precipitator, cleanable dry type filter, spray type washer with cooling coil, reheaters, and supply fan.

Conditioned air is delivered by the supply fans through vertical main duct risers of heavy construction to the existing 22nd floor loft, where these main ducts are run horizontally through the loft space paralleling the exterior walls. In the loft, round spiral conduit branch ducts are connected into these main trunk ducts

4 FOR MAIN BANKING floor, the balustrade is used to introduce the conditioned air into the space

and extend down and up through the floors between each pair of windows.

The maximum size of the vertical round branch ducts extending down from the 22nd floor loft is 10 in. in diameter and decreases in size as the riser approaches the lower floors. At each floor, flexible metal connections are extended from the vertical round duct risers to the cabinets installed at the windows. These cabinets under each window, two per bay, replace the radiators.

Each cabinet has a plenum near the base of the unit, into which conditioned air is supplied from the duct system originating at the apparatus in the penthouse. The air emerges from the unit plenum as a jet, which induces a secondary circulation of room air through an extended surface copper coil mounted in back of a grille on the face of the cabinet. The copper coil provides for either supplemental heating or cooling, as required. The mixture of air is then delivered to the room through a supply grille mounted on the top of the cabinet.

This individual room temperature control is accomplished by an automatic pneumatic thermostat installed behind the grille on the face of the cabinet which can be set by the occupant as desired to control the amount of water passing through the coil. In summer, at peak, approximately one-third of the cooling is accomplished by the primary air being delivered to the window cabinets from the equipment in the penthouse.

Further cooling is accomplished by circulating cold water through the copper coil mounted on the unit, which in turn cools the secondary air being induced over this coil from the room. During the winter, hot water is circulated through the copper coil to heat the secondary air. In the spring and fall, when the outside temperature is at a point where some exterior offices would require heating while others would need cooling, a source for both heating and cooling is available at the window cabinets. During this period the primary air is heated automatically on a schedule based on outdoor air temperature, and cold water is circulated through the copper coil for the source of cooling.

Paralleling the primary air duct riser between each pair of windows, two insulated pipes are installed for circulating hot or cold water to and from the copper coils mounted on the cabinets. In addition, a drain pipe is also provided to guard against possible condensation occurring at the window units. All of these risers are furred in with metal lath and plaster painted to match the walls.

Interior Zones Described

For the interior zones, two conventional low pressure air distribution systems are installed. The conditioning equipment, in the penthouses, consists of outdoor air intake louvers, outdoor air dampers, electrostatic precipitators, cleanable dry type filters, spray type air washers with cooling coils, dehumidified air dampers, bypass air dampers, filters, reheaters, and fans.

One set of equipment is in the north penthouse to serve the north wing and the center portion of the building, and the other set is installed in the south penthouse to serve the south wing. In each penthouse a fan is installed to return the air from the rentable space to the conditioning apparatus or to exhaust this air to the outside, depending on the requirements dictated by the automatic temperature controls.

From this penthouse the conditioned air for the interior zone is supplied through five vertical duct risers extending down to the seventh floor ceiling of the south wing and center part of the building and to the fourth floor ceiling of the north wing. These vertical risers are so located that there is no loss of rentable area. Two were located adjacent to the existing building stack shafts at the east end of the wing corridors, one was installed in the men's toilet, and two are located in elevator shafts made available for this purpose. Also installed in these elevator shafts are return air ducts, high pressure system air ducts, and pipe risers.

For the lateral distribution of air on each floor, branch ducts are installed extending from these vertical main duct risers throughout the interior space, and these ducts are located tight to the ceiling or exposed beams and adjacent to the corridor walls. In order to use the existing transoms over doors in the corridor wall for relief of the air supplied to the office, the depth of the lateral ducts is limited to 8 in.

Except for the main duct risers, which are of standard construction, the exposed ductwork throughout the rentable area is of streamline con-

5 FIDELITY - PHILADELPHIA TRUST building towers 30 stories above the street in downtown Philadelphia

struction with a smooth exterior surface painted to blend with the building interior finish. In some instances, for appearance, metal lath and plaster safing is used from the top edge of the duct to the ceiling and from the bottom edge of the duct to the corridor wall. (See Fig. 3) All of the supply outlets are mounted flush on the side of the streamline ducts. The building corridors are virtually clear except for an occasional small crossover duct at the ceiling.

Relief of the air supplied to the offices into the main corridors serves to ventilate the corridor and elevator lobby. Grilles mounted on the corridor walls and at the ceiling of the elevator lobby are installed for returning the air through vertical duct risers to the penthouse apparatus rooms.

When the building was constructed, a ventilating system was installed to serve most of the areas occupied by the trust company.

After making a complete survey of the existing installation, including the size, location and condition of the sheet metal ductwork, we made a study to determine what part of the existing system could be reused. In general, the equipment, such as fans, heating coils, pumps, and concrete air washers, were not satisfactory for reuse. Most of the existing ductwork beyond the apparatus rooms in the various ceilings and shafts was used, thus avoiding serious alterations to the architectural features of the banking space for the installation of an air system.

Major Apparatus Court Erected

All of the major conditioning apparatus is installed in a new equipment room erected on the sixth floor court at the rear of the center of the building between the wings.

In this room three sets of equipment are installed, consisting of apparatus similar to that installed for the interior zones noted above. One supplies conditioned air to the first, second and third floors of the north wing, and one serves to condition the fifth floor employees' dining room. The third apparatus supplies dehumidified air to seven zone recirculating fans, which are installed in existing basement equipment rooms made available when the original ventilating apparatus was removed.

The areas served by each zone recirculating fan were based on exposure and departments of special function. At each zone fan, dehumidified air dampers, return air dampers, filters and reheaters are provided for automatic control of the fan discharge temperature. In some branches throughout the ductwork, hot water booster heaters are installed for individual room temperature control.

Ballustrade Supply Ducts

The method of supplying conditioned air to the main banking space is typical of the use we were able to make of the existing ductwork. The main banking floor is a rectangle, 120 ft × 96 ft, with a coffered ceiling some 48 ft high. The walls and columns are marble faced. There is a balcony at the second floor level on two sides of the main floor. (See Fig. 4.) The balconies have a marble balustrade within which was provided, when built, ventilating ductwork to serve the lower portion of the high banking area. On the top surface of the balustrade, additional grilles were installed to deliver and direct the air over the balcony area. On the face of the balustrade, directional outlets were installed, replacing the existing decorative grilles, to supply the conditioned air over the main banking floor. For the space under the balcony, half round ceiling type diffusers were installed and connected to the risers supplying the ducts in the balcony balustrades.

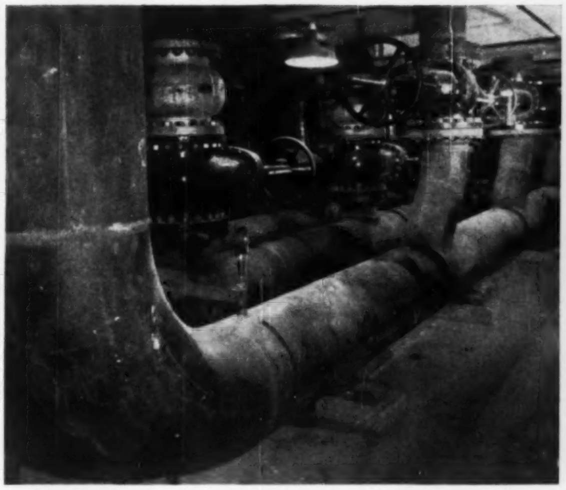
Throughout the entire banking space, use of the existing ductwork makes it possible to condition the area without disturbing the architectural appearance.

Piping and Central Equipment

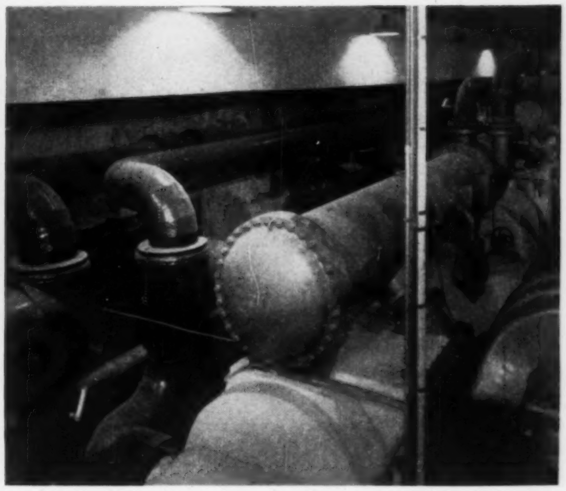
In the basement of the newly air conditioned Fidelity-Philadelphia Trust building, in the former silver vault, three centrifugal compressors develop 2500 tons of refrigeration. (See Fig. 7.) To install these machines, the floor of a space formerly used for the vault was lowered 6 ft to the level of the existing boiler room floor.

Two of the compressors are driven with 1000 hp squirrel cage motors and one by a 500 hp wound rotor motor. To provide space for the main chilled and condenser water pumps, one of the five existing boilers was removed and a concrete platform erected to support the pumps.

The cooling tower, on the roof over the center portion of the building, is approximately 90 ft long × 30 ft wide × 29 ft high and serves to cool 7500 gal of recirculated water for condensing purposes. The tower, a cross-flow type with the air inlet louvers facing the rear of the building, is constructed of redwood. Three sides of the tower are faced with cement asbestos board which blends with the building walls.



6 PIPE HEADERS — 20 in. diameter condenser water and 18 in. for chilled water — are supported on boiler room floor under pump platform



7 REFRIGERATION ROOM is in old silver vault in basement. In center is 500 ton centrifugal compressor. Note chilled water pipes supported on footings

The piping required to serve and to interconnect the air conditioning apparatus, the centrifugal compressors, the circulating pumps, the cooling tower, the secondary water circuit for the perimeter units and also to utilize the existing steam generating plant presented many problems to stay within the limitation of the building and structural loadings.

Steam Generating Plant

The steam generating plant was equipped with two manually oil fired boilers for main service, with three standby units which are stoker coal fired. This existing steam plant with its auxiliary equipment was left intact with the exception of the removal of one standby boiler to provide space for the main chilled and condenser water pumps. This area is adjacent to the new refrigeration room and the existing pipe shaft through which the 20 in. condenser water supply and return and the 18 in. chilled water supply and return risers are installed.

The vertical pipe risers installed in the shaft, extending some 400 ft from the lowest basement level to the roof of the new penthouse on the south wing, impose a high hydrostatic head on the piping circuits, pumps, condensers and coolers. The cooler and condensers were constructed with special water boxes, tubes and shells to withstand a pressure of 250 psi. The main condenser water and chilled water pumps were also provided with mechanical shaft seals designed for a pressure of 250 psi.

Refrigeration Room and Piping

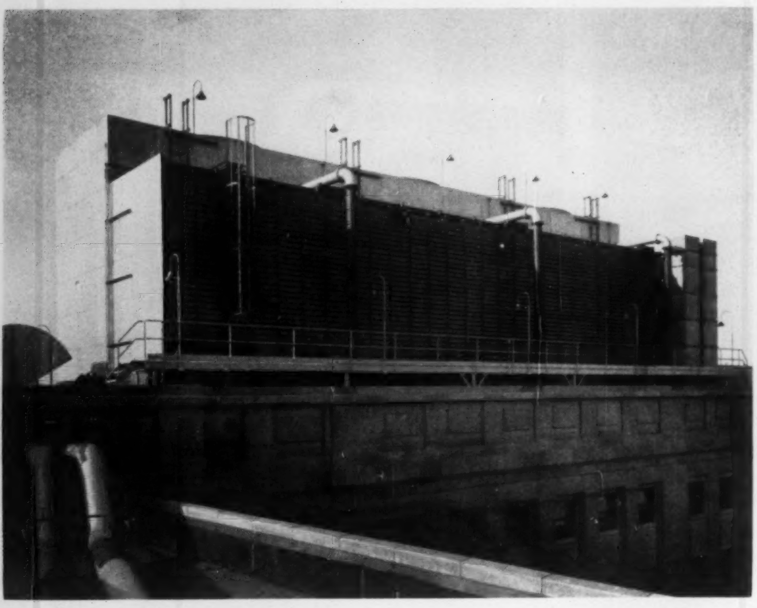
The refrigeration room is approximately 28 ft wide × 110 ft long. The main chilled water supply and return headers are located along one side of the space approximately 8 ft above the floor level. These headers are supported on top of the footings which were exposed when the floor was excavated to the boiler room level. (See Fig. 6) In the branch connections from these headers, stop valves are provided for each cooler at an elevation for ease of operation. Service stop valves are installed at all major pieces of equipment.

From the refrigeration room, the 18 in. main pipe headers extend to the chilled water pumps located on the platform in the boiler room. These pipes are installed near floor level and are supported on rollers in channels attached to concrete floor piers. From the pump location, the pipes extend along the floor on similar pier supports to the vertical pipe shaft and up the shaft to the roof of the building.

At the base of the shaft, a special foundation was provided to support a half million pounds of piping filled with water. On this base for each of the 20 in. and 18 in. risers spring loaded isolators are provided. Just ahead of the 26th floor level, a copper bellows type expansion joint is installed in each riser and at the 27th floor level, these pipes are anchored using structural steel attached to building steel framing. Above the anchor point, these pipes are offset to allow for movement and to arrange for proper alignment in leaving the shaft to extend across the new penthouse roofs to the locations where branch connections drop through the roof to serve the air conditioning apparatus.

Within the pipe shaft, structural steel is provided to guide these risers through the entire vertical run. The spacing of these guides is on approximately 46 ft centers.

Similar concrete piers, as described above, are used to support the piping across the new penthouse roof and the construction of the penthouses is designed to carry this load.



8 INLET LOUVERED side of cooling tower faces rear court of building. Note condenser water pipes on roof to tower

The 20 in. condenser water supply and return mains between the cooling tower, condenser and circulating pumps follow a similar routing as described above.

The total capacity of the chilled water circuit, when filled for operation, requires approximately 30,000 gallons of water. The water circuit for the condenser requires about 35,000 gallons.

Precautions were taken to completely isolate this piping from the building structure by using load bearing cork and heavy gage saddles at each support for horizontal runs. At each vertical guide point in the pipe shaft the same type of isolation is used, with the cork being encased in heavy draw band sleeve. Spring hangers and spring isolators are used at major points of movement. The main pumps are set on spring loaded supports to dampen vibration and prevent noise transmission.

As a point of interest, to install some 800 ft of 20 in. condenser water piping and 800 ft of 18 in. chilled water piping in the existing 9 ft × 7 ft pipe shaft required 20 working days. With a stiff leg crane mounted on the existing roof, 40 ft sections of pipe were hoisted from the street level to the roof and then lowered into the shaft and welded. All four risers were erected simultaneously.

Pumps Give Load Flexibility

For the chilled water circuit, three pumps are installed, each to handle one-third of the total 5400 gal circulated. Two are equipped with constant speed 100 hp motors; while the third pump is furnished with a two-speed 100 hp motor. The two-speed pump running at half speed in winter provides for a continuous circulation of water at sufficient velocity through the cooling coils to minimize the danger of freezing and to allow the closed circuit to remain filled for the entire year's operation, making the circuit readily available. During the spring and fall the source of cooling required for the perimeter cabinet units, as pointed out in the discussion under the air handling equipment, is accomplished by cooling the water circulated through the dehumidifier water coils, with the relatively low temperature outside air being drawn in through the air conditioning apparatus. This cold water is then available for the secondary water circuit, as required.

For the condenser water circuit, three pumps are installed, each to handle one-third of the total 7500 gal circulated. These pumps are equipped with constant speed 125 hp motors. Installing these pumps for each circuit also provides for flexibility of capacity as variation in load permits.

Two Secondary Water Circuits

Two secondary water circuits are installed in the penthouses for the supply of hot water or cold water to the perimeter cabinet units. One system serves the north wing and center portion of the building, and the other circuit serves the south wing. Each system or circuit is complete with pumps, heat exchangers, automatic mixing valves, expansion tanks, and strainers.

These circuits are termed "secondary water circuits" because the source of water for these systems, when cooling is required, is the tail water leaving the main chilled water cooling coils installed in the air conditioning dehumidifiers. The amount of tail water required is controlled automatically by mixing this cold water with recirculated water through three-way valves, operating in sequence, to maintain a constant designed cold water temperature at the pump discharge.

In winter operation, the secondary water circuit three-way mixing valves are positioned automatically to close the port connecting into the main chilled water return, creating, in effect, a closed secondary water circuit. During the winter season, the water temperature at the pump discharge is controlled automatically by an outdoor master compensating thermostat, which resets a submaster thermostat in the pump discharge. This, in turn, controls in sequence automatic steam valves in the steam supply to the heat exchangers to maintain a predetermined water temperature based on the outdoor temperature. At night and over weekends, when the air conditioning system is off, the secondary water pumps continue to operate, supplying hot water to the window cabinet units for gravity heating.

Secondary Piping, Pumps

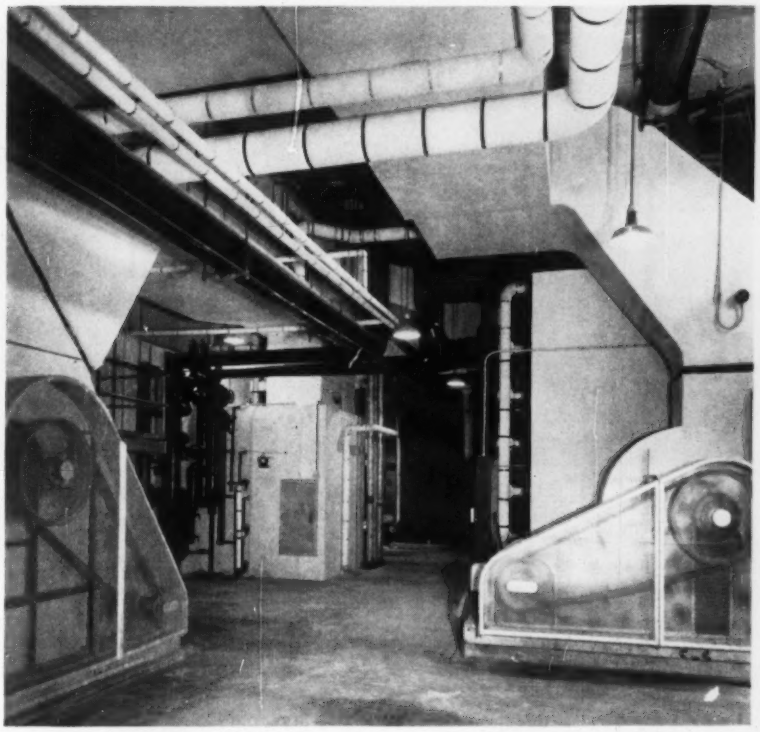
In general, the piping for each secondary water circuit is installed from the penthouse downpipe shafts to the 22nd floor loft, where the mains, designed for reverse return, run horizontally throughout the loft, paralleling the high pressure ductwork. The risers supplying the window cabinet units were not designed for reverse return because of the cost involved and space limitations. In lieu of the reverse return, piping was sized for a limited pressure drop. A valve was installed to maintain a constant differential pressure at the mid-point, and a new design of radiator valve was used for more accurate control.

Two pumps are installed for each secondary water circuit, each south wing 25 hp pump to deliver 570 gpm and each north wing 30 hp pump to deliver 860 gpm.

For the steam service to the new apparatus installed in the roof penthouses and in the sixth floor court apparatus room, steam at 100 psig is supplied, re-using existing piping where possible. In each apparatus room a two-valve pressure reducing station is installed to supply a medium pressure of 25 psig steam for the air conditioning reheater and preheater coils, heat interchangers, and the existing kitchen service equipment. The steam coil and interchanger performance was selected for 25 psig steam.

City water make-up for the chilled water circuits and secondary water circuits is introduced at the expansion tanks. These expansion tanks are located above the main building house tank. Small pumps are used for the additional lift. The pumps are controlled by float operated switches. Similar pumps are installed to maintain the water level in the cooling tower, when required.

A connection is provided in the refrigeration room to supply city water to cool the compressor bearings and the compressor oil cooler on each machine. This water is piped from each machine to an open tank. The water accumulated in this tank is then pumped from the refrigeration room to the cooling tower, as required for make-up.



9 IN SOUTH PENTHOUSE apparatus room, conditioned air supply to the interior zone is at left, conditioned primary air supply to the perimeter zone window units at right

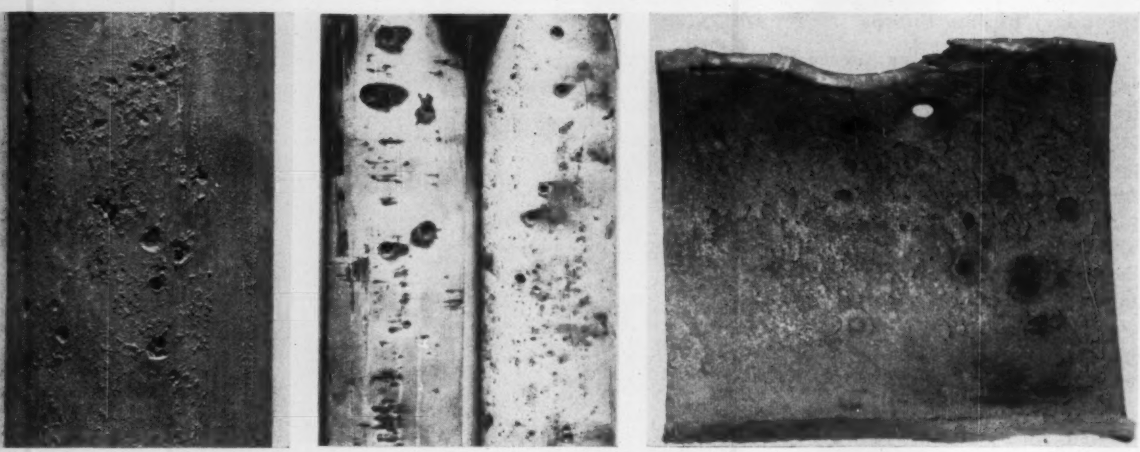
Work Progressed Night and Day

The Fidelity-Philadelphia Trust building turned on the air conditioning system on July 1, 1954, on schedule, nine months after the start of the installation. The fact that this project was completed in such a remarkably short period is not only due to the full cooperation of the building management and the tolerance of the occupants during construction but also to the planning and scheduling of the work.

All cutting was done at night to prepare openings through the floors and partitions for the installation of ducts and pipes. The high pressure air conduit duct risers and secondary water risers to serve the window units were installed during the day, with a minimum disturbance to the tenants. Most of the window unit riser services were installed during the winter season. To maintain steam flow to the radiators for heating, temporary connections were installed to re-route the runouts and clear the space for the new services installed. In April the radiators were removed to install and connect the new window cabinet units to the services previously erected. The interior supply ductwork throughout the rentable areas was installed after hours of occupancy.

The remainder of the installation, including the construction of the penthouses, the preparation of the refrigeration room, the piping, ductwork and apparatus installed in the penthouses, the piping and ductwork in the 22d floor loft, and the main piping work, was installed during normal working hours. Plastering, furring, painting, and similar restoration work were also done during normal working hours.

The air conditioning and mechanical services for the building were designed by Charles S. Leopold, consulting engineer, and the architectural changes were performed by Day & Zimmerman, Inc.



1 PITTING is the most destructive form of corrosion on the water side of boiler tubes. Above are three examples of pitting due to dissolved oxygen. Left and center, fire tubes; right, water tube

Eleven Ways To Avoid

Boiler Tube Corrosion

By H. F. Hinst

Chief Metallurgist
Tubular Products Div., Keystone Plant
The Babcock & Wilcox Co.

CORROSION TROUBLES in low pressure heating boilers — which usually operate at a pressure below 15 psig, and are often of the horizontal fire tube type — often occur unnecessarily.

During the past 50 years we have had many occasions to examine boiler tubes to determine the reason for their failure. In very few cases have any defective qualities in the tubing been the cause of the corrosion. In the vast majority of instances, the necessity for replacement has been traced to conditions of environment.

In power boilers, it is a rare occurrence to find corrosion of the type common to heating boilers. This is because operators of power boilers realize the importance of proper water and fire side conditions and take care to avoid such problems.

The users of heating boilers are, first of all, usually not aware of the possibilities of corrosion. Often they have little idea what causes it and lack the know-how and experience to combat it. Fortunately, scale is not a major factor in low pressure boilers, although a build up of scale at tube ends has occasionally resulted in failure by grooving next to the tube sheet.

Let us first consider the various mechanisms which lead to pitting or water side corrosion since this is the most common type. This accounts for 75 percent of the tubes examined in our laboratory.

Steel does not corrode appreciably in dry air, but only in the presence of moisture. Likewise, steel will not corrode in clean, alkaline, freshly boiled water, if air is kept away.

This has been proven to our satisfaction by placing samples of tubes in ordinary tap water in flasks and boiling the water, causing the steam to condense and run back into the flask. When we allowed the condensed drops of water to be free to contact the air, corrosion of the tubes took place. When we took the oxygen out of the air in the flask and condenser by running the air through pyrogallic acid, which is an oxygen absorbing liquid, no corrosion of the tubes took place.

Oxygen and Velocity Factors

This proves that the presence of oxygen is an important factor in corrosion problems. It was also found that if the heaters were shut down at night, the corrosion was much more rapid than if the apparatus were kept boiling. In effect, some of the oxygen was excluded from the flask by the steam space over the boiling water. In low pressure heating boilers, however, the return water usually enters at the bottom, which does not afford the oxygen reduction which would be obtained if it would drop through the steam space.

Pitting is probably the most destructive form of corrosion that affects the water side of boiler tubes. Frequently, only a few pits are present and most of the surface is unattacked. In other cases, the pits cover most of the surface, and as a further extreme, the pits all run together and the corrosion takes the form of uniform attack. The frequency of the pits is determined to a large extent by the degree of acidity or alkalinity of the water.

Acidity and alkalinity are expressed by chemists in terms of a scale of pH values — hydrogen-iron concentration — on which a strong acid solution — strong muriatic or sulfuric acid — is rated as 1, and a strong alkaline — concentrated caustic soda — solution is rated as 14. A neutral water has a pH value of 7.

Below a pH of 5, the water is actually sufficiently acid to dissolve the steel and under these conditions, no pits form. Instead, the corrosion is relatively uniform and the steel gradually gets thinner until it is too weak to hold the pressure, or a small hole develops.

Between a pH of 5 and 9.4, pitting takes place at a rate depending on the concentration of oxygen in the water. Therefore, while operating the boiler, it is necessary that all air or as much air as possible be excluded from the boiler water.

It has been shown that a strip of steel hung in the middle of a fast moving stream did not rust, while an identical piece hung in a stagnant pool along the edge of the same stream pitted badly when connected to the first by a wire. This proves that velocity and air content have an effect on the corrosion of steel. In most cases, the pitting in horizontal fire tube boilers takes place along the top of the tubes on the outside, and it is our belief that this may in part be due to the difference in velocity of the rising water and steam bubbles, creating an eddy effect along the top of the tube and accelerating the corrosion, much as did the experiment of the flowing stream.

In any event, pitting would not occur in this type of boiler if no oxygen were present in the water.

Practically all ground surface supplies of water contain air dissolved in the water in quantities depending on its source, time of exposure and its temperature. Cold water will retain more air than warm water, as can be seen by filling a clear bottle with cold water from a tap and allowing it to stand overnight. Small air bubbles will form on the sides, demonstrating that as the water warms up the gas is liberated.

This release of the air in the form of bubbles creates a problem in a

Follow These Rules

Out-of-Service Factors

1 **Boil out the boiler with an alkaline cleaner after installing new tubes to remove oil or other coatings from the tube surfaces. These protective coatings are commonly applied to new tubes to prevent rusting during storage and transit, and will cause corrosion if left on the tubes during operation of the boiler.**

2 **Bring a steam boiler to a good steam output as soon as it is filled after draining to deaerate the water. Heat the water in a hot water boiler to 180 F for the same reason. A temperature of 180 F will not remove all the air, but the majority will be driven off.**

3 **Add sodium chromate or caustic soda to the water in the quantities recommended.**

4 **In greenhouses or in damp locations, put a tray of unslaked lime in the ashpit to absorb moisture, and close the boiler. Inspect this lime occasionally and renew when it becomes mushy.**

In-Service Factors

1 **Keep all boiler fittings airtight.**

2 **Add sodium chromate or caustic soda to the water in the quantities recommended.**

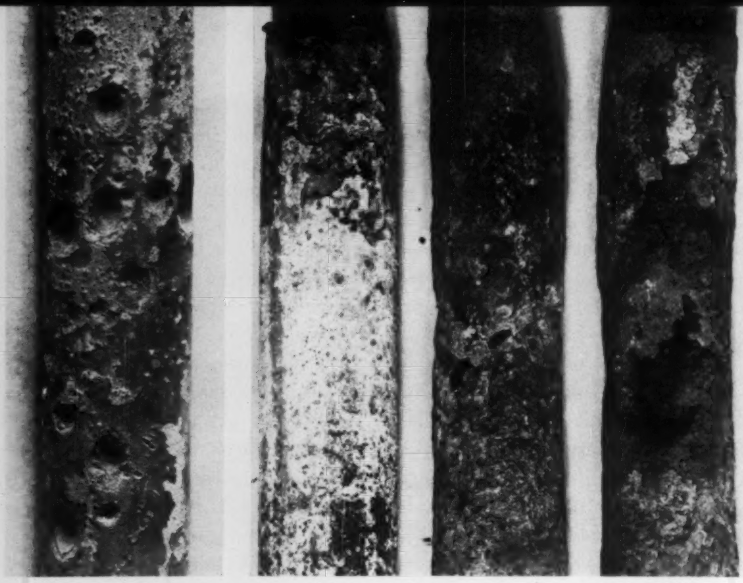
3 **Preferably use a fuel with low sulfur content, to avoid the corrosive action of sulfur gases.**

4 **Brush and flush and dry out the insides of fire tubes as often as possible to remove soot and other products of combustion, and prevent the accumulation of moisture and condensed sulfur gases.**

5 **Use sodium sulfite regularly in the boiler feedwater to remove dissolved oxygen.**

6 **A suitable feedwater heater or deaerator is also recommended to reduce the oxygen content of the boiler feedwater.**

7 **Prevent water leakage and do not periodically drain water out of the system. These add to the necessity for the constant addition of make-up water, result in loss and dilution of the treatment, and introduce air into the system.**



2 WATER LINE CORROSION of vertical fire tubes is accelerated by scale formation but is actually caused by dissolved oxygen in the boiler water

newly filled boiler. In a new boiler, or one which has been drained and refilled with cold water, as the water warms up, air bubbles form on the tubes, and in a very short time pits develop under these bubbles due to the difference in oxygen concentration under the bubble and the oxygen concentration in the water surrounding the bubble. Penetration as high as 50 percent of the tube wall has been known to take place in one stagnant period of two weeks duration. Once these pits form, they proceed rapidly even under operating conditions.

Why New Tubes Corrode

Sometimes a set of new tubes installed in a boiler has been found to last less than a year, whereas the former tubes lasted five to 10 years. Obviously, something has changed. Often the tubes are blamed for the failure, when actually there have been changes associated with the operation and maintenance of the boiler. A different method of starting up may have been used. Circumstances may have been such that the boiler was immediately fired when the old set of tubes were put in, while the new set may have been exposed to the fresh water for some time and air bubble pitting may have started, leading to the eventual failure of the tubes. The temperature of the fill-up water may have been different, and, therefore, more air was present in the new installation. The composition of the fill-up water may have changed; a thin scale may have been laid down at the beginning of the life of the old tubes, which served as a protection. Changes in electrical connections may have induced stray currents, leading to possible electrolytic corrosion. Small air or steam leaks around pipe joints and valves may have let air into the new set-up. Air vents may have become plugged due to jarring of the piping. In short, any number of things may have happened and caused the failure.

A large number of boiler tube failures take place in the fall when starting up for winter operation. These are due to both the air bubble pittings previously mentioned, and to oxygen sucked into the system through packing and other sources.

Remove Air from Water

To minimize chances of this occurring, a freshly filled boiler should be heated to bring the water to a good boil, and the steam so produced should be vented off to carry the released gases out of the boiler. Following this boil out, the vents should be closed and the boiler used or cooled down if not needed.

In the larger boiler installations, air is removed from the feedwater by heating it up to the boiling point and venting off the dissolved gases. In small installations, this is hardly practical.

Air can, therefore, be kept out of a boiler by heating up the feedwater and releasing the air.

Another method suggested by F. N. Speller, a noted authority on corrosion, is to pass the feedwater through a deactivator, which is a tank containing steel scrap such as turnings or wires. The oxygen in the water attacks the steel in the tanks so that corrosion properties are neutralized. The process is satisfactory if the tank is big enough to permit complete deactivation and if the scrap steel is renewed often enough. The practice is not frequently followed in steel heating boiler installations because other methods of control are usually more desirable.

In addition to the air carried in by make-up water, substantial quantities may be pulled into the system during operation by the vacuum in the condensate line or the vacuum formed when the boiler is shut down or the fire is allowed to die off. In small heating boilers, warm days during spring and fall and even in the winter often result in cooling down a boiler and radiators. This causes a vacuum which pulls air into the system through leaking pipe connections, traps, vents, valves and packings. Proper maintenance of the entire heating system is a *must*.

With all these ways of air getting into a boiler, it appears that it is most difficult to keep it out. Fortunately, there are methods for rendering it inactive in boiler water.

How To Remove Oxygen

One method of removing oxygen from boiler water is through the use of an oxygen absorbing chemical such as sodium sulfite. If only small quantities are required for small quantities of oxygen, the addition of this chemical is practical. It is impractical, however, to try to take care of large quantities of air by using this chemical in large quantities, since constant additions would cause foaming.

Inhibitors are a class of chemicals which deposit a coating on the surface of the steel or react with it in some way to protect it against attack. The Steel Boiler Institute compound, composed mainly of sodium chromate, is one of these. When added to the water in the recommended quantities, it will protect the boiler surfaces during either operations or standby. Since it is harmful if taken internally, and since it may stain other products, it should not be used wherever the steam is to be used for process work. It has the advantage of imparting a yellow color in the water, which the boiler user can see in the gage glass, and he can thus readily determine if more is needed.

Don't Drain Chemicals

Many boiler owners completely drain their boilers once or twice a season under a mistaken belief that the water in the boiler is dirty. Actually, this practice and the practice of periodically draining small quantities of water from the boiler, should be discouraged as it causes loss of chemicals and requires make-up water which brings in more oxygen. However, if additional chemicals are added each time, to compensate for losses, little harm would be done. Insurance companies require periodic tests of the low water cut-off, and at such times protection should be insured by the addition of such chemicals.

Instead of inhibitors, alkalizers such as caustic soda may be used. It is recommended that 2 oz of caustic soda per 100 gal of boiler water be added at the time of a fill up. This will insure a pH of 11 to 11.5, which will greatly reduce the pitting effect of dissolved oxygen. Some prefer a lower concentration, down as low as 1.3 oz per 100 gal, but outside of the possibility of foaming, the larger quantities can do little harm and act as a safety factor should losses take place by draining.

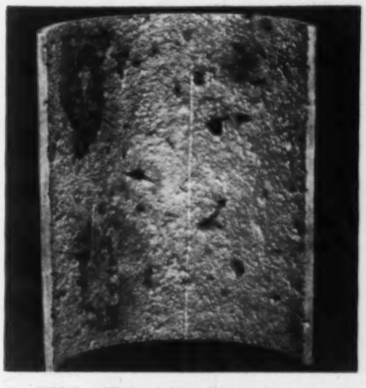
In new boilers, or in old boilers which have been retubed, a boiling out, using cleaning compounds, is suggested. This is necessary to remove oils and other coatings put on the tubes by the manufacturer prior to shipment or storage. These materials are put on the tubes to protect them from rusting during storage and transit and have no place in a boiler. Since they may shield portions of the tube from direct contact with the water, pitting may be accelerated. A good boil out is recommended, using a cleaning compound such as one of the newer detergents or a mixture of 2½ lb of caustic soda and 2½ lb of soda ash per 100 gal of boiler water.

Fire Side Corrosion

Approximately 15 percent of the tubes we have examined have failed by fire side attack. Corrosion on the fire side of boiler tubes is caused by moisture condensing from the atmosphere during periods of shut down, or from flue gases during operation. This type of corrosion is especially troublesome in boiler installations near bodies of water or where the atmosphere is otherwise humid. Fire side corrosion is accelerated by the use of high-sulfur fuels. Sulfur gases may condense on tube surfaces during operation, depending upon the kind of fuel, its sulfur content and the methods of firing.

Accumulations of soot on the tubes should be periodically removed. Soot attracts moisture; and air, moisture and steel together result in attack of the tubes. Cleaning may be daily, weekly or monthly, depending on the fuel used and the method of firing.

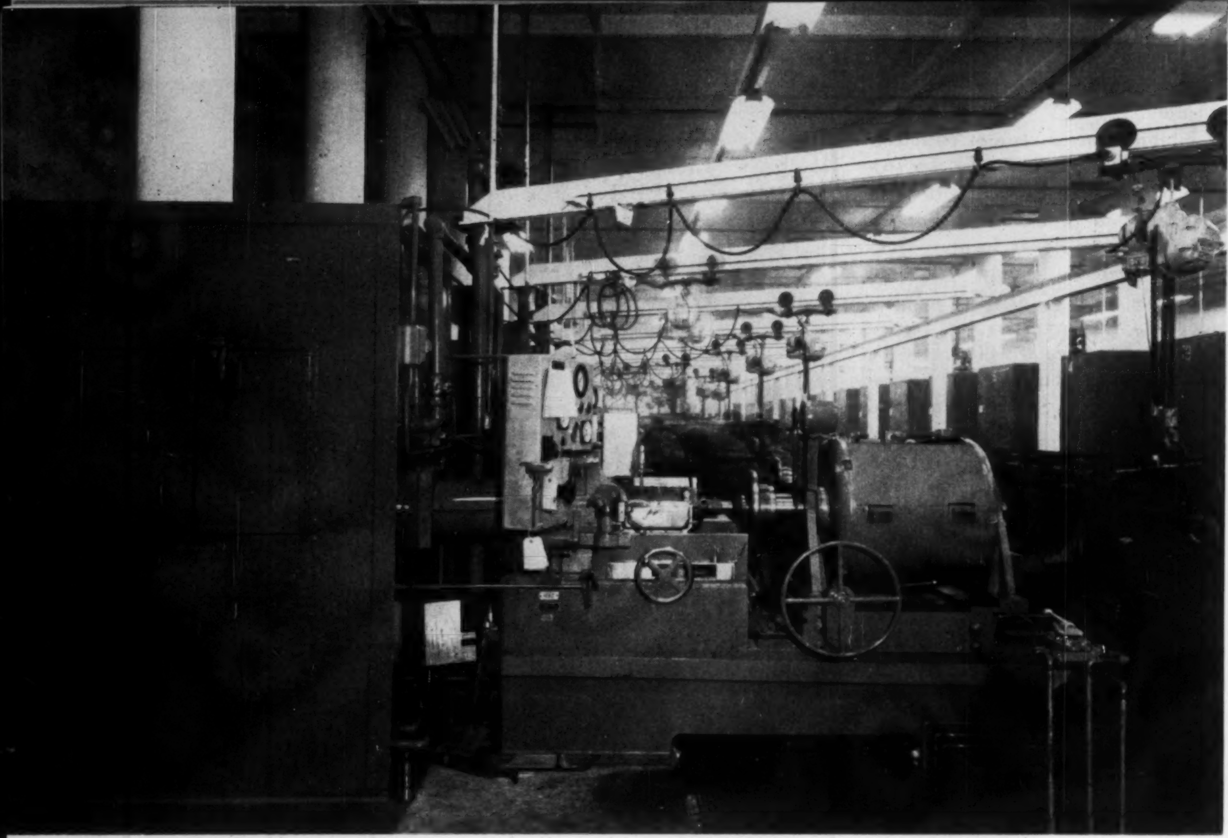
Some boilers — for example, those in greenhouses — may operate at water temperatures of 140 F to 150 F, and under such conditions the condensing gases form sulfurous and sulfuric acids, which attack the tubes and result in a more uniform type of corrosion. If the percentage of sulfur in the fuel is high, this situation is worse. Even in the absence of sulfur compounds, corrosion may occur during shutdown periods because of high humidity in the air. When shutting down the boiler under such conditions, the fire side tube surfaces should be brushed and flushed to remove the winter's accumulation of soot and other products of combustion. This should be followed by blowing air through to dry out these surfaces. Also, in extremely humid locations, the stack should be disconnected, or at least the damper should be closed, and a tray of unslaked lime placed in the ashpit to keep the fire side dry. This lime must be renewed whenever it becomes mushy, so the drying effectiveness will not be lost.



3 FIRE SIDE CORROSION is shown above on a section from a fire tube which has been cleaned with inhibited acid

Oiling the tube surfaces with a good grade of oil is also recommended after cleaning the tubes before shut down periods. Many samples of scale removed from fire side surfaces have been found to be acid when mixed with water. Is it any wonder then that the tube metal eats away to eventual failure? We have heard reports of boiler rooms in damp cellars, some with water on the floor constantly. Occupants of buildings who use their basements in the summer, or who store articles there, know how clothes and leather mildew from the dampness. It is obvious, then, that humid air may have ready access to the fire side of boiler tubes if not kept out or protected against.

The rest of the failures are rather infrequent cases of impingement attack or corrosion at tube ends due to the presence of oxygen in the boiler plus strains set up while rolling in the tubes.



1 ENGINES in 42 — eventually 60 — ventilated soundproof booths are connected with the transmission being tested and with the dynamometer outside. The white stack at the top of each booth is the 16 in. diameter duct described in the text

How Concentric Triple Ducts Ventilate Test Engine Booths

. . . at General Motors transmission plant

By K. E. Robinson

**Ventilation Engineer,
General Motors Corp.**

• Engines for testing hydramatic transmissions are housed in 42 individual soundproof and insulated booths, all in an air conditioned room. To prevent engine heat and noise from entering the main room, a multiple duct system was designed to supply make-up air and exhaust ventilation air.

On August 12, 1953 the most disastrous fire occurred in industrial history at the Detroit Transmission plant — the only manufacturers of the hydramatic transmission. As spectacular as this fire was, it was completely overshadowed by "Operation Hydramatic" that followed.

"Operation Hydramatic" covered the entire job of reclaiming as much as possible from the ruins and setting up a completely new plant at Willow Run, some 20 miles away. It is fairly well known that the plant was back in operation in only 84 days after the date of the fire, but how this was done is not common knowledge.

Of interest is the way the operation was organized. A team consisting of a plant engineer, master mechanic, production man and others for each of the 30 some production departments was formed. It was the responsibility of each to get his department in operation regardless of what the other departments were doing. All of these men, other than those employed by Detroit Transmission itself, were brought in from other General Motors divisions. Two weeks after the fire I was placed in charge of the industrial ventilation phase of the operation. In this article only industrial ventilation will be discussed and only one special application.

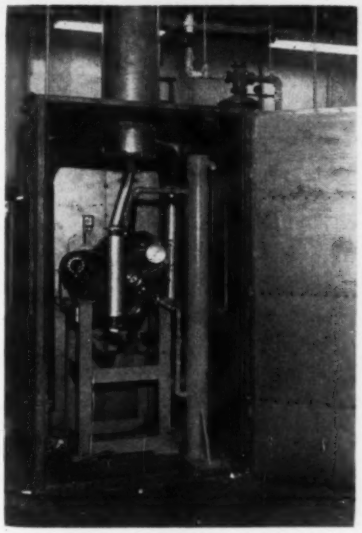
200 Ventilating Systems

The industrial ventilation consisted of some 200 separate systems. They range from a complete dust collecting system serving many machines to a single stack and fan from one isolated operation. As it was some 50 ft to the roof, with a crane 36 ft above the floor which had to be in operation at all times, even the individual stacks became a problem.

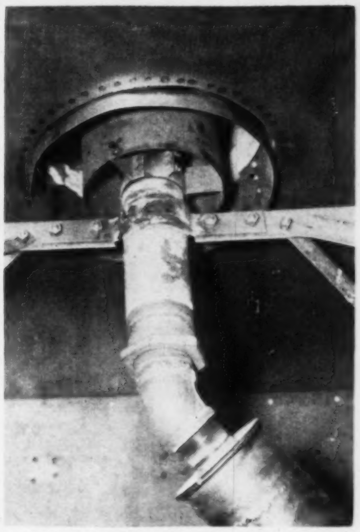
Ventilating Engine Booths

One of the most interesting problems, however, was how best to ventilate a series of acoustical booths, each one enclosing an internal combustion engine that would be operated under all load conditions.

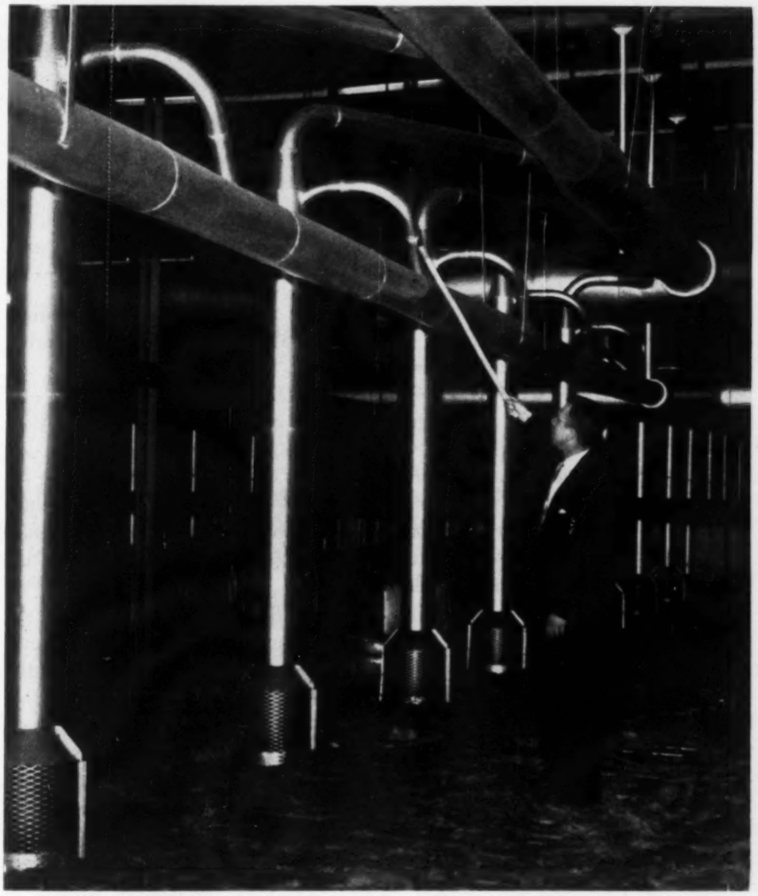
In testing hydramatic transmis-



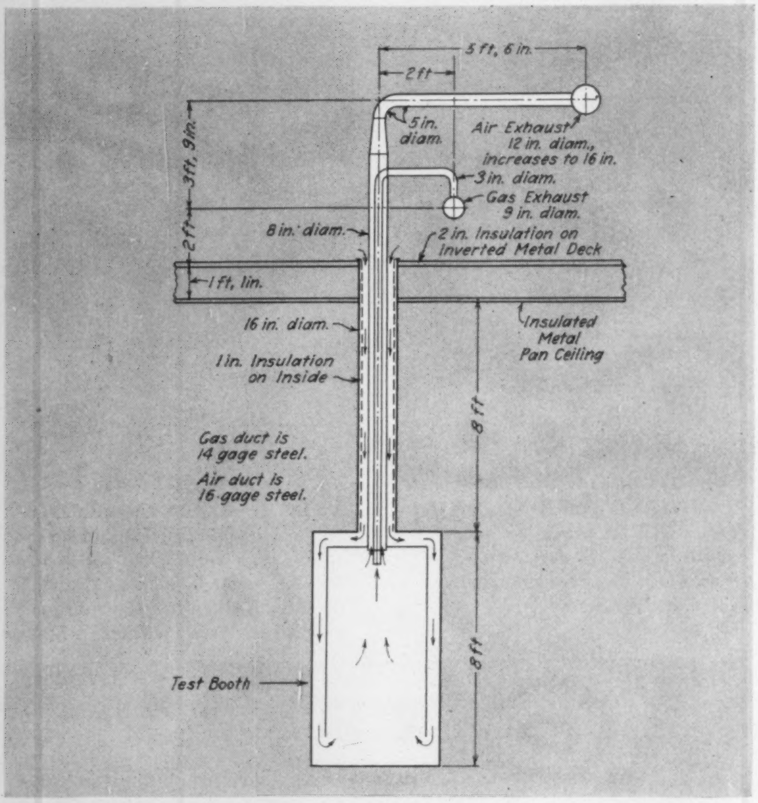
2 INTERIOR OF ONE BOOTH with engine in place. Note the two round ducts at the rear of the booth from which the make-up air is introduced into the booth



3 IN THIS CONCENTRIC assembly of ducts, air supplied through the 16 in. stack for cooling the engine and for safety is exhausted through the 8 in. stack, while the 3 in. duct exhausts gas from the engine



4 DUCTWORK above the suspended ceiling includes separate manifolds for the products of combustion and for the air from the booths. After the 3 in. ducts leave the main stack, the 8 in. duct is reduced to 5 in. Air is drawn into the booth through the expanded metal in the 16 in. duct


5 ft, 6 in.
2 ft
3 ft, 9 in.
2 ft
5 in. diam.
Air Exhaust 12 in. diam., increases to 16 in.
3 in. diam.
Gas Exhaust 9 in. diam.
8 in. diam.
2 in. Insulation on Inverted Metal Deck
1 ft, 1 in.
16 in. diam.
1 in. Insulation on Inside
Insulated Metal Pan Ceiling
8 ft
Gas duct is 14 gage steel.
Air duct is 16-gage steel.
8 ft
Test Booth

5 **EXHAUST SYSTEM DETAILS** for Cadillac test engine booth show air travel paths through the three different ducts and how ducts are nested. Insulation and soundproofing prevents engine heat and noise from being transmitted to the air conditioned room

sions, each unit is connected to an automobile engine. By means of a dynamometer, road conditions can be duplicated so that the transmission can be operated in all ranges and speeds.

As part of the test includes the collection of sound data from the unit, each engine is placed in an 8 ft high acoustical enclosure to eliminate the engine noise from the room. One booth had been built, tested and found to be satisfactory and all that remained was to develop a ventilation system that would:

1) Satisfactorily cool the engine.

2) Prevent the engine heat from being transferred to the air conditioned room in which the booths were located.

3) Prevent noise from the engine exhaust from entering the room.

4) Be acceptable, appearance wise.

The contract to build and install 42 of the proposed 60 booths had already been let, and immediate specifications for the ventilation were desired.

It was estimated that 300 cfm would cool the engines. So, to satisfy the other three requirements, it was decided to install a 16 in. duct — Fig. 1 — with a 1 in. acoustic liner for each booth. Inside this would be an 8 in. duct and inside this a 3 in. duct. As is shown in Fig. 4, the 8 in. and 3 in. ducts are each connected to separate manifolds. Individual blowers exhaust the air from each of these. With this arrangement and with the booth closed tight as it would be during operation, air is drawn from the space above the room through the 16 in. duct to the bottom of the booth. It is then released and allowed to rise over the engine to aid in cooling. (See Fig. 2.) This same air is then drawn into the 8 in. pipe and then discharged outdoors. In the meantime, the products of combustion are exhausted out through the 3 in. duct. In Fig. 4, showing the duct work in the space above the room, it will be noticed that the 8 in. pipe is reduced to 5 in. after the 3 in. pipe is brought out. This change in duct size increases the resistance enough to produce an orificing effect, in order that equal distribution of air might be expected with a minimum of reductions in the manifold.

Increase Air For Safety

When about one-third of the installations were made and workers were almost ready to operate some of the engines, it was decided that since the engines were to be run on natural gas and a leak might develop in the gas line, more air should be admitted to the booth. Calculations showed that the operation should be safe in case a line in the booth ruptured, providing 600 cfm was admitted and exhausted at all times.

The original design called for a blower to deliver a total of 300 cfm through 60 booths, or 18,000 cfm. As only 42 were to be installed at first, it was decided to deliver 600 cfm through each one, or a total of 25,200 cfm. The fan laws were applied and the motor and blower sheaves were changed accordingly to provide the desired air flow rate.

At the same time, approved air switches were installed in each main ahead of the blower so that all blowers must be operating properly and air flowing through the ducts before the main gas valve could be opened which would allow gas to flow to the engines. When the system was completed, field tests showed that the exhaust rate was 625 cfm per booth.

Difficulty was experienced with the starter, and it was found that the solenoid mounted on the starter beneath the manifold was getting unusually warm. A small shield of aluminum was placed between the manifold and the solenoid to reflect the radiant heat which reduced the surface temperature of the solenoid as much as 50 F.

Renewing Underground Piping

. . . with copper tube inserts cuts costs in half

• Fifty year old underground piping systems are increasingly coming up for replacement because of corrosion or failure. The use of copper tube replacements is spreading to the district steam heating industry and also has possible applications in industrial piping systems. Details of one method of installation are given here.

By G. K. Saurwein
Mechanical Engineer,
New England Gas and Electric System

THE RENEWAL of old underground piping, installed 50 or more years ago which has failed or deteriorated from corrosion, not only presents a real problem but the cost is generally much greater than the cost of making the original installation. This added cost is partly due to breaking and restoring the pavement or other surface and coping with the numerous other services which have since been installed and thus hamper the work.

This renewal problem set men to thinking, especially those in the gas distribution industry where such failures are most prevalent. About 25 years ago, gas utilities began to experiment with copper tubing for replacements, inserting the tubing into the existing pipe, and today it is standard practice with many gas companies. Even though the pipe size is reduced, the friction drop is less for the smooth copper tube than it was for the barnacled old pipe. Water companies, too, in many parts of the country for years have been using soft drawn copper tube for service connections. And the same method which is increasingly being used in district heating applications, also has possibilities for use in industrial piping systems.

The American Gas Association has established a method for installing such replacements.* Here, as most anywhere, mechanizing the job results in a faster installation and lower costs. This method utilizes a small air compressor, air operated winch, tube cleaner and other accessories. The usual sizes involved in gas piping are $\frac{3}{4}$ to 2 in., although some larger sizes are also used. Type K, the heavier weight of soft drawn copper tube, is the material that is usually used. The $\frac{1}{2}$ in. ID size fits into the $\frac{3}{4}$ in. pipe, $\frac{3}{4}$ in. tube into the 1 in. pipe, 1 in. tube in $1\frac{1}{4}$ in., and so on.

How Tubing Is Installed

The installation is made through an opening over the main and through the basement. After a 2 x 4 ft hole is dug over the main, the service is cut 12 in. from the main, and all fittings are removed and the tap is plugged. The meter and connections are removed, and a $\frac{3}{4}$ in. air hose is connected to the meter cock. The service is then blown out with compressed air from the basement to the street. A wet burlap bag is placed over the street end of the service to reduce the dust nuisance. Next, the air operated boiler tube cleaner is run through the service connection, and it is blown with compressed air for a second time. If a curb cock is encountered, this can be bored through.

The winch is set over the main and the cable pulled into the basement with a $\frac{1}{16}$ x $\frac{1}{4}$ fish wire. A tube guiding sleeve is screwed on the basement end of the old service line to aid in straightening the coiled tube. The rubber expanding pulling head is then attached to the tube and it is pulled in by the winch. A little oscillation of the tube back and forth by hand eases the pulling. A mechanical grip for pulling wire or cable may be attached and the tube pulled in with a lever or pulling jack.

Final connections at the main and in the basement are made with compression fittings. At brass or copper to steel connections in the ground, the adjacent pipe and fittings for 15 in. to 20 in. should be carefully coated and/or wrapped to prevent galvanic corrosion. The basement connection can be made with an insulating coupling or union.

In many cases, this tubing has

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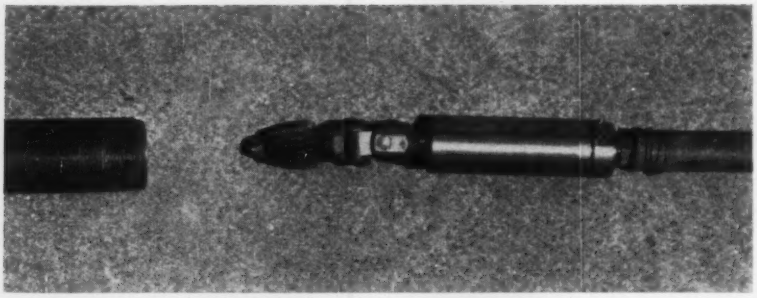
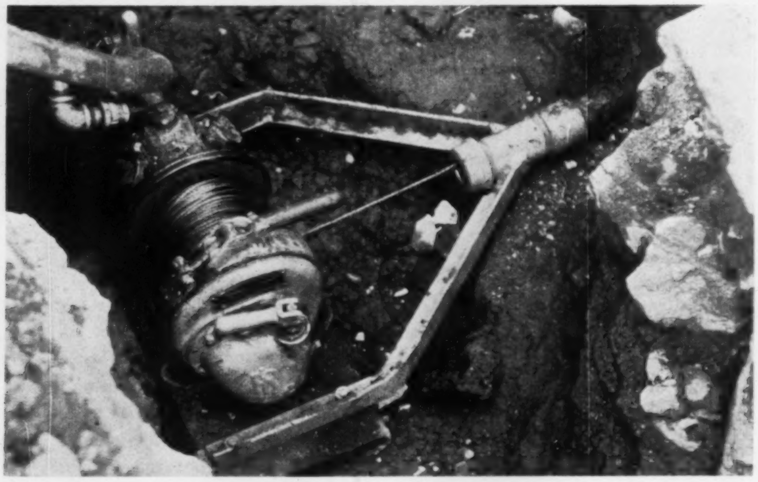
*Equipment and Procedure for Service Renewals with Soft Copper Tube, American Gas Association Operating Section, No. DMC-51-9.

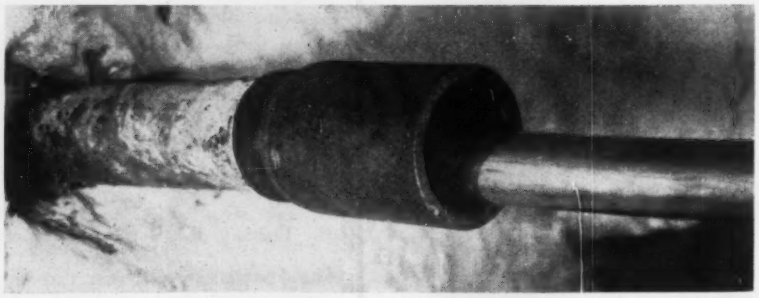
Here's How It Is Done



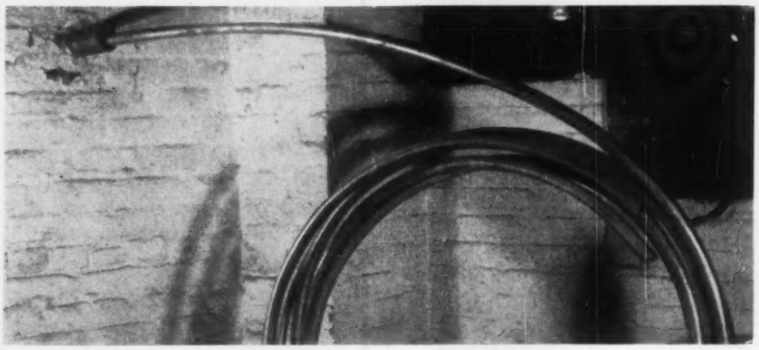
1 FIRST, THE AIR operated tube cleaner is run through the service connection and then compressed air is applied



2 NEXT, THE WINCH is set over the main and the cable is pulled into the basement with a 1/16 x ¼ fish wire



3 A TUBE GUIDING SLEEVE is screwed on the basement end of the old service line to aid in straightening the coiled tubing



4 THE RUBBER EXPANDING pulling head is then attached to the tube, which is pulled into the line by the winch been installed with as little working clearance as 2 ft in front of the service entrance. If the service has an offset or bend, that, of course, will also have to be uncovered. These copper tube services are in use where pressures up to 60 psi prevail.

Advantages Listed

The principal advantages of this procedure are:

1) Appreciable savings in cost—50 percent or more.

2) Savings in manpower requirements.

3) Minimum disturbance to the public.

4) Experience indicates that the life of copper tube will be long.

5) Tests show that the capacity of such replacements are equal to and often greater than the capacity of the old pipe, and should remain so for their entire service life. The electronegative quality of the copper eliminates the need of coating and wrapping except at copper to steel connections.

Straight tube in 10 and 20 ft lengths has also been used, the tubes being inserted in the old service a length at a time and connected with soldered inside sleeve joints. Joints are tested at 10 psi with a hand pump and soap solution and with the forward end plugged. Straight lengths of tube are sometimes joined by heating and quenching the tube end, driving in a belling tool about an inch and making a hard solder sweated bell and spigot joint.

Copper for Old Steam Services

In the case of district steam services operating at relatively high temperatures and usually encased in conduit, corrosion of pipe is not nearly so prevalent as in the much older gas and water utilities. Many district steam companies having services 40 years old, installed under good conditions, find them today as good as new. When corrosion occurs, it is usually external due to seepage of ground water into the conduit. Several old wood insulated lines or services installed in corrosive soil conditions have had to be replaced, and of course, renewals of steam service connections will increase in number as the age of the systems increases.

The use of copper tube inserts as practiced by the gas utilities has been tried in a number of cases. Where the insulation is still effective, the method is definitely worthwhile for it cuts the cost of renewals approximately in half.

Precautions to be Taken

The code for pressure piping limits the use of copper tube to a temperature of 406 F, which corresponds to a saturated steam pressure of 250 psi. Thus, it would seem to be suitable for most district steam services. The coefficient of expansion of copper is about 40 percent greater than steel; therefore, greater allowance for this must be made.

An example of this practice reported by a large midwest utility is the renewal of a 2½ in. diam. service 28 ft long by inserting a 1½ in. type K copper tube. Normal construction was used at the two ends.

In another case reported by the same utility, a 2 in. type K copper tube was inserted in an old 7 in. wood log main 50 ft long. Here a 15 ft excavation was made opposite the entrance to the building. A 15 ft length of tube was insulated with sectional covering and pushed into the old main, then another length was connected, insulated and pushed in, and so on. Steel connections were made at both ends. Where dissimilar metals are joined, there should be an insulating joint to prevent electrolytic corrosion.

Great care should be used when brazing or bronze welding copper lines when under pressure. Copper becomes "hot short" at about 1580 F, and melts at 1980 F.

Other district steam companies have made replacements in this manner, inserting steel pipe inside of existing lines at considerable savings.

ASRE Marks "Golden Jubilee"

. . . name change voted down

The American Society of Refrigerating Engineers marked its "golden jubilee" at its annual convention last month in Philadelphia. Over 700 refrigerating engineers were on hand to celebrate the anniversary.

At a special session, the proposal to add the words "Air Conditioning" to the name of the ASRE was voted down.

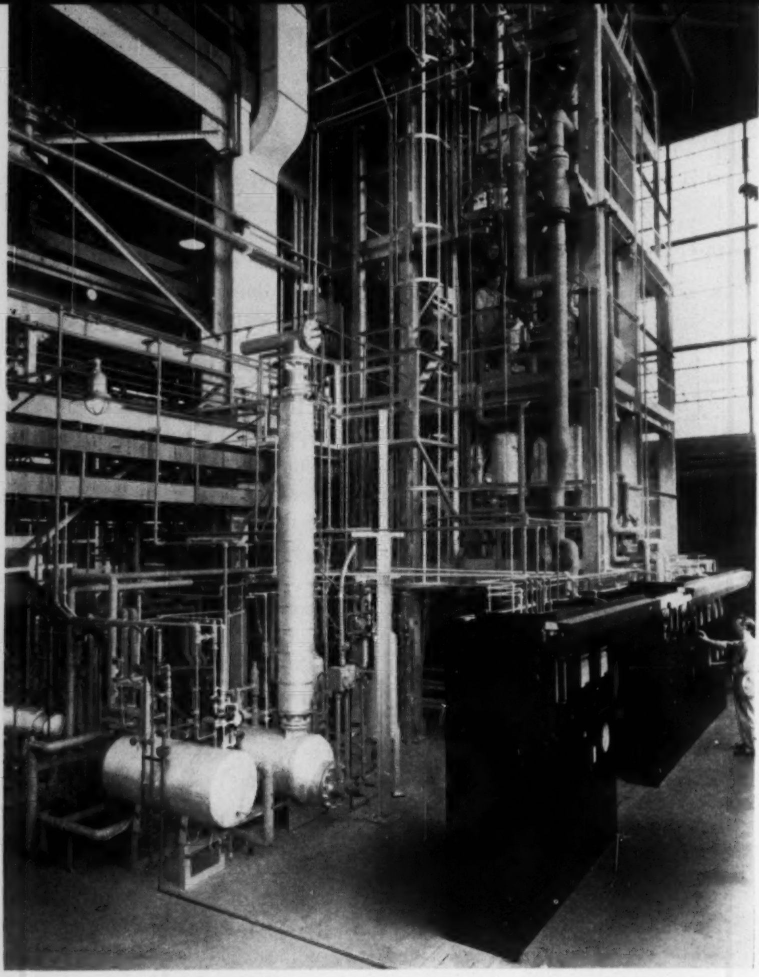
Leon Buehler, Jr., chief refrigeration engineer of the Creamery Package Mfg. Co., Chicago, was installed as president of the ASRE at the meeting, and Carlyle M. Ashley, chief development engineer of the Carrier Corp., Syracuse, N.Y., was installed as first vice president.

Hermann F. Spoehrer, vice president and treasurer of the Sporlan Valve Co., St. Louis, was installed as second vice president, and Cecil Boling, president of the Bush Mfg. Co., West Hartford, Conn., as treasurer.

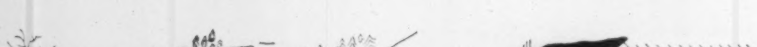
The installation ceremonies were presided over by the retiring ASRE president, Arthur J. Hess, president of Hess, Greiner & Polland, Los Angeles. The new officers will serve for 18 months, in order to coordinate their terms with those of the society's section officers.

R. C. Cross was appointed executive secretary of the ASRE by the society's council at its December 1 meeting in Philadelphia. He joined the headquarters staff early in November as consultant. He succeeds M. C. Turpin, who is retiring after eight years spent with the ASRE and after some 35 additional years spent in the refrigeration industry.

Robert C. Blatt was appointed director of ASRE publications.



1 SYNTHETIC LIQUID FUEL manufactured in this plant from coal is but one development in the current search for new sources of power



2 INDUCED CAVING applied to steeply pitching anthracite beds is an example of improved methods under way in fuel production and utilization

Where

By Kalman Steiner

THE WORLD TODAY is power hungry and will need more power for its industrial appetite tomorrow. Nation after nation is girding for an economic output far beyond anything it has yet achieved. In the United States, increasing productivity is considered one of the keys to future economic security. But to meet the tremendous demands for energy, new sources of fuel are needed.

Fuel engineers and economists, foreseeing a rapid depletion of presently available fuels within a few short generations, have urged caution in the rate of consumption of some of our special fuels, for these supplies are not unlimited. Therefore, a vigorous program of research has been waged to discover new sources of fuel and to improve production and utilization. And while nuclear energy is the most exciting new fuel development, and undoubtedly the most significant, there are certain other trends which are clearly discernible and of importance to the fuel engineer and to the industrial economy.

Look, for example, at the changing pattern of energy sources our economy has already experienced in only half a century.

Behind this changing fuel pattern

Mr. Steiner, of C. Hoffberger Co., has written widely on fuels from a background of much practical experience and careful analysis. In recent years, he has summarized the fuel situation annually for HPAC. He is a member of HPAC's board of consulting and contributing editors.

Is the Fuel Coming From?

. . . to supply tomorrow's needs

Here is HPAC's annual picture of the fuel situation, highlighting this year the changing patterns of fuel consumption and supply

lie some interesting facts, both as to statistics — see Table 1 — and technology.

Coal Was King

Historically, anthracite became the first mineral fuel mined in this country. For many years, it was the principal domestic fuel other than wood. It reached peak production in 1917 at 99.6 million tons. Competition by oil and gas for home heating has steadily reduced its most important market. During 1953 production totaled 30.9 million tons, and in 1954, through November, 24 million tons — a reduction of 15.2 percent from the corresponding period of 1953.

Of current production, over 40 percent is consumed by industrial users and 10 percent exported, principally to Canada. Average production rate in 1900 was 2.4 tons per man-day; in 1953, 3.06 tons; and 3.28 tons in 1954, through November. Even the apparent increase in the production rate does not tell the full story because the increase per man-day, slight as it is in 54 years, comes about by the increase in strip mining, which now produces 25 percent of all anthracite. Underground production is still at the rate of 2.5 tons per man-day.

Development of anthracite cutting machines for underground mining has been retarded by the hardness of the coal. Recent improvements by using tungsten carbide tools holds some promise of helping boost the rate. Another improvement in mining technique is in the recovery of anthracite from sharply pitching beds by induced caving. (See Fig. 2.)

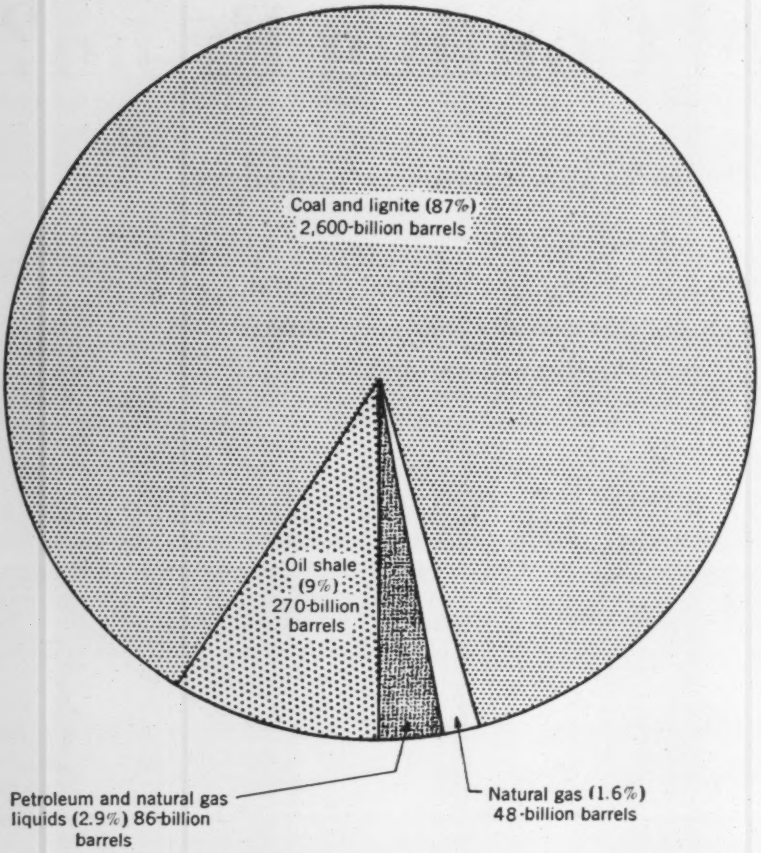
Market research to find new outlets for anthracite have been along the avenues of metallurgical and chemical uses. Mixed with coke, it has been used in Belgium for melting iron and steel scrap in a blast cupola, and large scale experiments are being carried out in the U. S. For such use, a high ash content is desirable, because of the silicon content — in sharp contrast to fuel applications, where low ash is sought. Other uses are in gasification to synthesis gas for ammonia manufacture, and for reducing phosphorous; i.e., removing oxygen from phosporous bearing rock in fertilizer manufacture.

The peak production year for soft coal — bituminous and lignite — in the U. S. was 1947, when 630.6 million tons were mined. Of that amount, 68.7 million tons were exported. Since that year, production has declined, being 457.3 million tons in 1953 and 348.4 million tons in 1954 through November, a reduction of 16 percent from the same period in 1953. Principal points of export are Europe and Canada. In addition, we imported a small amount of soft coal, chiefly from Canada, the bulk of the imported coal going through the customs districts of Maine and New Hampshire in the northeast and Montana and Idaho in the northwest.

Despite the decrease in total soft coal production, the amounts mechanically mined and loaded have increased. Also, a great deal of soft coal is taken by strip mining. The productivity per man-day is about 7.5 tons, or about three times the rate for hard coal. Over half the bituminous and lignite mined yearly is now cleaned before going to market.

TABLE 1—THE CHANGING ENERGY SOURCES of the U.S. can quickly be summarized by comparative figures, as brought out in the following percentages

Energy Source	1900	1925	1944	1953
	Percent	Percent	Percent	Percent
Coal				
Anthracite	18.4	7.2	4.9	2.0
Bituminous & lignite	70.5	62.1	48.9	30.3
Total coal	88.9	69.3	53.8	32.3
Oil				
Domestic crude	4.7	20.2	29.3	35.0
Imported crude	—	1.7	0.8	5.7
Total oil	4.7	21.9	30.1	40.7
Natural Gas	3.2	5.8	12.0	23.1
Water Power	3.2	3.0	4.1	3.9
Total energy, Trillions Btu	7,893	21,920	33,176	39,125



3 IF ALL FUEL RESOURCES were converted to liquid fuel, the estimated liquid fuel resources of the U. S. would be accounted for as above

The Bureau of Mines classifies coal consumption into eight groups. For 1953, the percentage of each group stood: Electric power utilities, 26.3; bunker foreign trade, 0.1; railroads, 6.5; coke, 26.4; steel, 1.4; cement, 2.0; other industrials, 22.9; retail, 14.4. As recently as 1944 the railroads used 23 percent of all soft coal consumed; such has been the extent of dieselization. In the category of electric power utilities, it must be borne in mind that a remarkable improvement in efficiency has kept down coal consumption. In 1919 the average coal consumption per kw hr was 3.2 lb; in 1953, 1.06 lb.

The Bureau of Mines carries on intensive geologic studies into reserves of coking grade coal, because that is the most serious problem posed currently in bituminous coal. Our steel industry requires metallurgical grade coke to operate a blast furnace. During the past two years the Bureau has issued nine reports of such investigations, covering counties in West Virginia, Maryland, Pennsylvania, Kentucky and Tennessee. It is also stated that coking grade coal exists in Colorado, New Mexico, Illinois and Indiana. Experimental development continues on the coal burning gas-turbine locomotive, with control of fly ash the most serious obstacle at the moment. Work is also being performed in Canada, on burning Nova Scotia and Alberta coals, employing a heat exchanger. In this country, there is important application of the steam turbine to electric drive locomotives, using coal fuel.

Oil Demand Increasing

Petroleum continues to show an increase in total demand. The Bureau of Mines expected a total of 2,363 million barrels of crude oil production in 1954, compared to 2,360 million in 1953, and crude oil imports in 1954 of 239 million barrels against 236.3 million in 1953. Actual American production is about 1.5 million barrels per day under full capacity. Hence our importation of crudes is to some extent voluntary, in that we could produce our total requirements if other considerations did not dictate otherwise.

New discoveries of oil in Arizona and Nevada add two more states to make a total of thirty petroleum producing states. There have been important new discoveries in Mississippi. Canada is also increasing its petroleum production and refining.

Two new refineries in the Puget Sound area and one in South Dakota have built up the West's refining capacity. The latter will run Rocky Mountain crude. The Puget Sound refinery already in operation — only one is completed — is running on some Canadian crude, but uses considerable oil from Venezuela and the Near East. Economic conditions make sea borne crude cheaper in this area than Canadian oil run down through a pipe line.

There is still need for improvement in drilling techniques, to increase drilling speed. Much improvement is reported in augmenting total recovery from wells by using pressurizing during original flow instead of resorting to means for secondary recovery after normal flow ceases. Recently a large well area in the Scurry Canyon field of West Texas was pressurized by pumping down gas and water. It is expected that ultimate recovery will be raised by 700 million barrels. This type of operation requires coordination by the several ownerships represented in a field.

During 1954 a new pipe line was laid to bring petroleum products into Alaska. It extends 625 miles, from Haines to Fairbanks. A 297 mile section runs through Canada. There are five pumping and storage stations along the route, which essentially parallels the Alcan Highway and was laid to serve the defense installations of that area. The world's longest submarine pipe line was started along the Louisiana coast line. It will be 48 miles long.

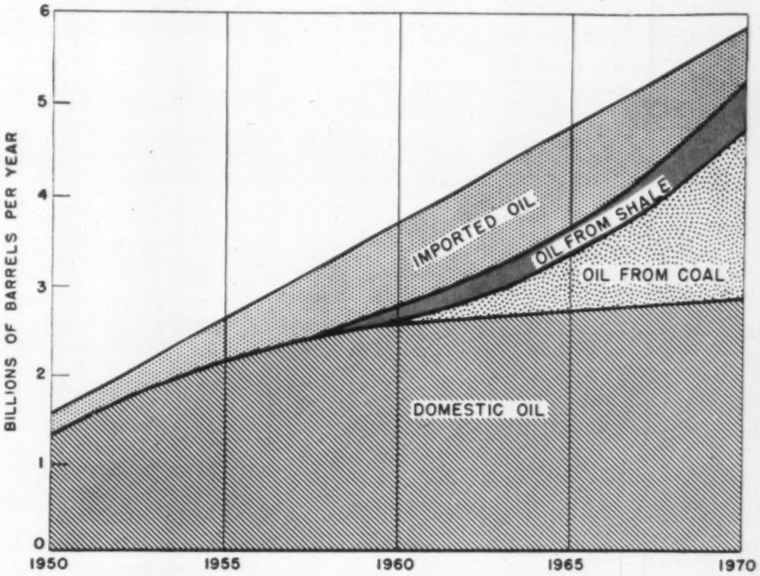
According to the New York *Times*, petroleum is by far the most important commodity in international trade. The *Times* estimates that in 1954 a total of 2,375 million barrels of petroleum and products would cross national boundaries, and that the value would be $7.5 billion.

National Gas Sales Rising

Natural gas consumption, as in the case of petroleum, continues upward. During the first and second quarters of 1954 consumption exceeded the same quarters in 1953 by 5 percent and 3 percent respectively. The sale of liquefied petroleum gas (LPG) is also rising. This gas, of course, is a by-product of petroleum refining.

During the summer of 1954 the Supreme Court handed down its decision in the Phillips case which involved the jurisdiction of the Federal Power Commission. The decision gives that body authority to regulate the price of natural gas at the well head. K. S. Adams, chairman, Phillips Petroleum Co., has said "Already the operating burdens and economic uncertainties thrust upon producers by federal regulations have served to reduce the interstate gas supply. The Supreme Court decision has resulted in abandonment, curtailment or suspension of at least three major gas transmission projects."

A gas pipe line has been approved to bring Canadian natural gas into the Seattle area.



4 AS FUTURE SOURCES of distillate fuels, coal and shale will be increasingly important in the next 15 years (from *Coal Age*)

Synthetic Fuel Program

The tempo of synthetic fuels production has slowed down, but one important event occurred during 1954. The large gas synthesis plant of Carthage Hydrocol, in Texas, originally built to make synthetic liquid fuels and chemicals from natural gas, had been shut down as a result of technical difficulties. Stanolind Oil and Gas Co. has taken over the plant, will revamp and recondition it, and resume operation. The plant's original design gave it a capacity to process 90 million cu ft of gas and 280 million cu ft of air daily into an output of 6000 barrels of gasoline, 900 barrels of diesel fuel, 200 barrels of fuel oil and 300,000 lb of chemicals. It never exceeded one-third of capacity prior to being shut down.

The Bureau of Mines continues extensive investigation into various phases of synthetic fuels, feeling that much basic research is necessary before commercial operation can begin on conversion of solid fuel into liquid fuel. These studies are carried on at many stations throughout the country, and include investigation of oil shale retorting and underground gasification of coal.

Another article on this subject — review of the atomic energy situation — will appear in a future issue.

The author wishes to express his thanks to Harry Perry, Assistant Chief, Fuels and Explosive Division, U. S. Bureau of Mines and his staff for their cooperation.

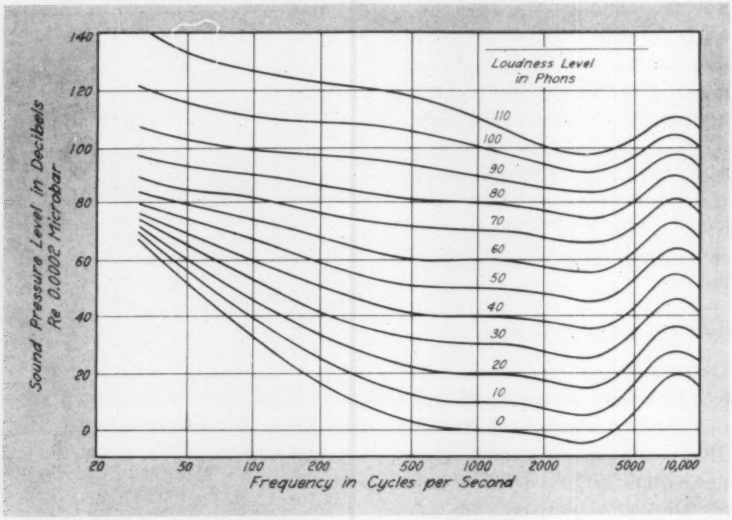
Air Conditioning's New Customer: Food Stores

. . . future is promising

AIR CONDITIONING will be in great demand by food stores in the next few years, according to M. M. Lawler, vice president of the Worthington Corp. He said recently, "The use of air conditioning by food stores is of particular significance because they have been among the last, as a group, to embrace air conditioning in their merchandising operations.

"When air conditioning first entered the retail fields", Mr. Lawler said, "it was confined largely to relatively high priced specialty shops. This type of store was faced with the serious problem of seasonal slumps during hot weather. Air conditioning was installed to counteract that slump.

"Since food stores are less seriously affected by seasonal slumps, they have been late in the field. It is our belief, however, that in a few years no new food stores will be put up without air conditioning and that by 1958 existing large food stores will make air conditioning a part of their operations."



1 EQUAL LOUDNESS contours for pure tones (by Churcher and King). The phon loudness level gives a true rank order rating to sounds but does not give a true relative rating

How Loud Is Loud?

". . . Decibels don't tell. Therefore, let's eliminate the controversy by adopting this improved noise rating method that's been proven satisfactory."

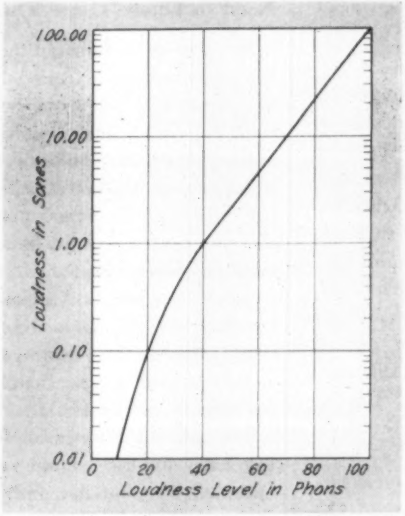
- **Sound rating is of increasing importance to heating, piping and air conditioning engineers and contractors. Better methods of rating noise are needed.**

Here's an improved method of rating by equivalent tone, which combines the basic relations of sound intensity, frequency and ear response. The author describes the principles and techniques of metering noise levels by this new method, the result of intensive research by several investigators in the field.

THE DECIBEL as used in evaluating noise levels is perhaps the most controversial engineering unit in use at the present time—not that it is basically defective, but because it has been misused so widely. Although it is not a measure of loudness, it has been widely adopted in noise level evaluations as a single-figure noise rating. The apparent discrepancies between "sound levels," which are sound pressure or energy levels, and actual loudnesses have caused confusion and controversy.

Such discrepancies are likely to occur wherever the noises involved cover a broad band of the sound spectrum, as most noises do. In comparing fan noise ratings, for example, it is not at all unusual to find that there are as many results in disagreement with actual relative loudness as there are in agreement. Although noises which are similar in sound frequency distribution do compare favorably with one another under the decibel rating method, they do not compare favorably with other noises of different frequency distribution.

The present controversial decibel rating is rapidly being abandoned in many organizations. For example, the Power Fan Manufacturers' Association is discouraging the publication of decibel ratings among its members, emphasizing, rather, approximate results as a guide.



2 LOUDNESS VS LOUDNESS LEVEL (by Fletcher and Munson). The loudness units are called sones

By R. A. Gerlitz

Chief Engineer,
Propellair Div.,
Robbins & Myers, Inc.

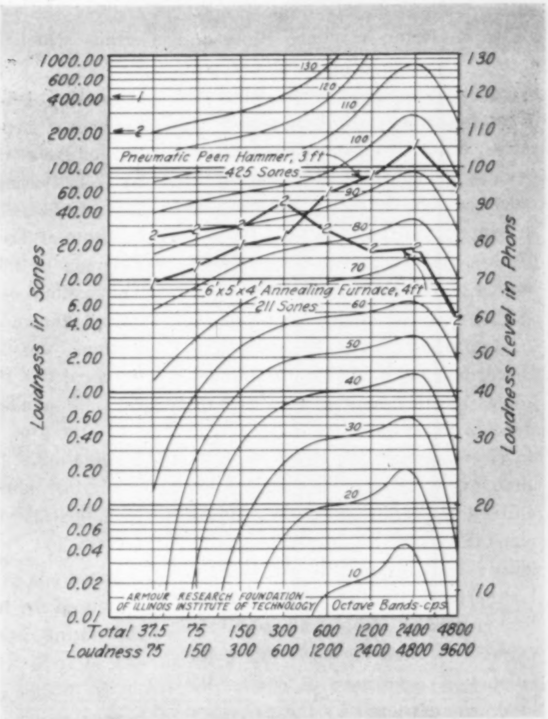
The National Association of Fan Manufacturers has adopted a resolution that "sound ratings for centrifugal fans, utility sets, axial fans, centrifugal type unit heaters and central station cabinet type air conditioning units are not recommended for publication."

The Industrial Unit Heater Association, too, is considering abandoning the decibel rating. The sponsors of the annual National Noise Abatement Symposium, who represent the spearhead of the current movement on noise control, have dropped completely the idea of overall single-figure decibel ratings of noise as read by the conventional sound level meter. That point is no longer discussed among them — it is a settled fact.

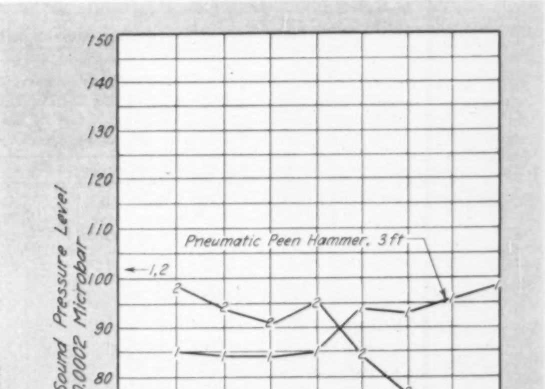
Prime Factor in Noise

Loudness is frequently the only factor considered in determining noise annoyance, but there are many other factors which affect the amount of annoyance a noise may cause, and not all of them are measurable under the present state of the art.

Noise is defined as any *undesirable* or *annoying* sound. Since people are different, no single method of rating noise will suit all. What may be annoying to a high-



3 LOUDNESS VS OCTAVE BAND LEVELS. To use this chart, plot the decibel level of each octave band on the appropriate vertical line and read off the loudness in sones on the left hand scale



4 CONVENTIONAL GRAPHS of octave band levels for two noises of equal overall level plotted in decibels vs. frequency give a misleading picture of loudness distribution strung violinist may be quite acceptable to a riveter or punch press operator. The age of the listener and his occupational and medical history affect his hearing. Individuals themselves differ from one day to the next, with aural acuity varying as much as five decibels.[1] Fluctuations in hearing can be influenced by lack of sleep, psychological state, and the degree of momentary alertness.

Then too, the quality of a noise is an important factor in annoyance. Discordant pitch combinations sound unpleasant to nearly all ears, and the staccato pulsations of a machine gun or rivet hammer are certainly more annoying to all ears than the smooth uniform noise of an electric power plant, though they be equivalent in intensity and frequency distribution. Furthermore, the masking effect of background or ambient noise and the method of listening also affect the amount of annoyance as well as the loudness registered by the ear.

Obviously, not all these factors can be measured and presented as a single-figure annoyance rating. However, loudness, as the prime factor in annoyance, *can* be measured quantitatively and evaluated with a simple rating which agrees with ear response.

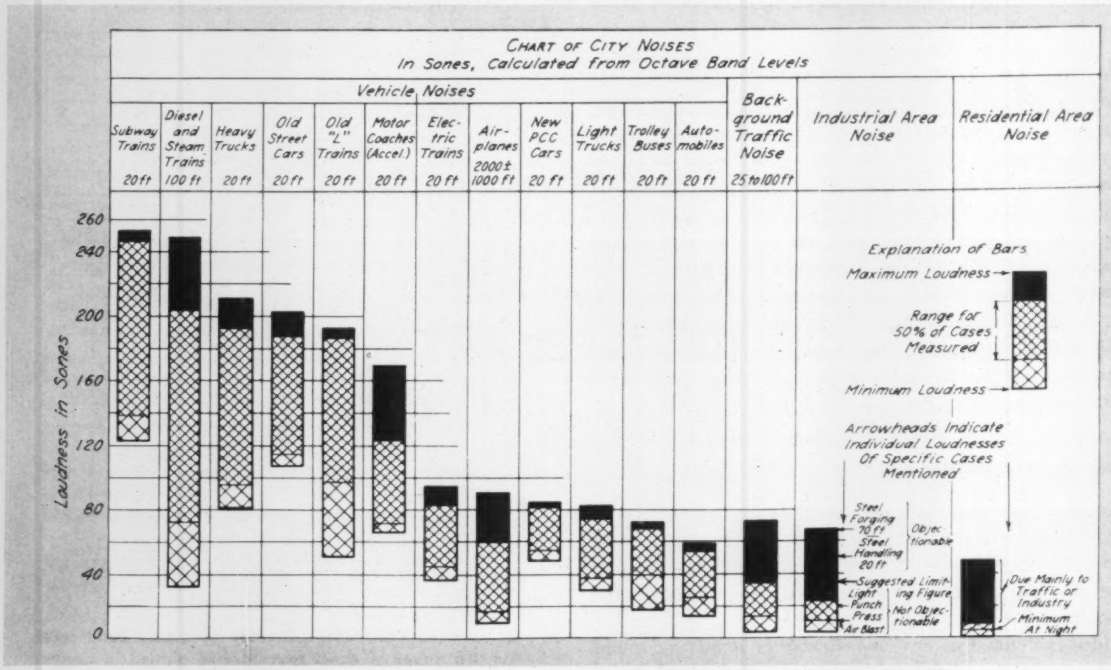
In May 1951 a greatly improved method of measuring and calculating the loudness of sounds was reported by L. L. Beranek, J. L. Marshall, and A. L. Cudworth of the Massachusetts Institute of Technology, and A. P. G. Peterson of the General Radio Co.[2] This method of rating the loudness of noises, known as the equivalent tone method, was simplified and put to practical test by Daniel B. Callaway, G. L. Bonvallet, Howard C. Hardy, and others of the Armour Research Foundation.[3,4,5] The results were gratifying and in good agreement with the subjective judgment of observers.

Hundreds of different noises were measured for loudness. In every case the rating assigned to each noise placed it in true "rank order;" that is, the louder noise always carried a higher rating. This is in sharp contrast to results from decibel ratings where it is not at all unusual to find as many results in disagreement with group judgment of actual relative loudness as are found in agreement.

Need to Know Three Things

In order to understand the equivalent tone method of rating noises, it is necessary to know the basic relations of sound intensity, frequency, and ear response. The decibel level is a convenient mathematical quantity for indicating the sound pressure or the sound energy level. It is not of itself an indication of the loudness of a sound, but simply a more convenient way of stating sound pressure than is dynes per sq centimeter, or of stating sound energy than is watts per square centimeter.

The relation between loudness and frequency for the average ear as determined by Churcher and King[6] is shown in Fig. 1. Each contour line on this chart represents points of equal loudness. Thus, a 50 cps tone of 79 decibel level sounds exactly as loud to the average ear as a 1000 cps tone of 60 decibel level. It will be noted that the contour lines are spaced 10 decibels apart at the 1000 cps frequency and coincide with the decibel graduations at that frequency. The *loudness* level for each contour line is given in phons and is numerically equal to the decibel level of a



5 CITY NOISES in Chicago, as reported in a survey by the Armour Research Foundation. Indicated are maximum, minimum and intermediate ranges of loudness

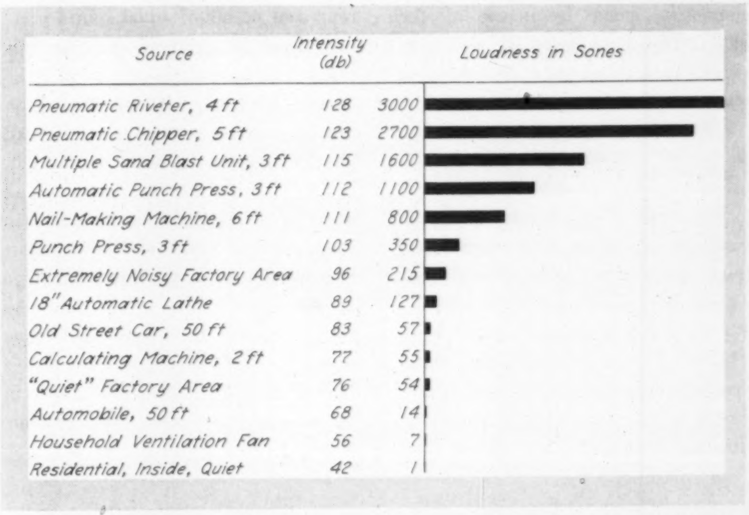
1000 cps tone. Thus, the contour lines are spaced at intervals of 10 phons everywhere on the chart.

Phons and Sones Compared

The phon loudness level gives a true rank order rating to sounds but it does not give a true relative rating. An increase in loudness level of 10 phons might mean a tenfold increase in loudness or it might mean slightly more than a doubling of loudness, depending upon whether the sound is in the low level or the high level range. Fig. 2 shows the relation between loudness and loudness level in phons for the average ear as determined by Fletcher and Munson. The loudness units have been named "sones." Sones are simple units for the layman to deal with because their value is such that 20 sones sound twice as loud as 10 sones, and 5 sones sound one-half as loud as 10. These are units with which the layman feels at home, like feet and inches, dollars and cents.

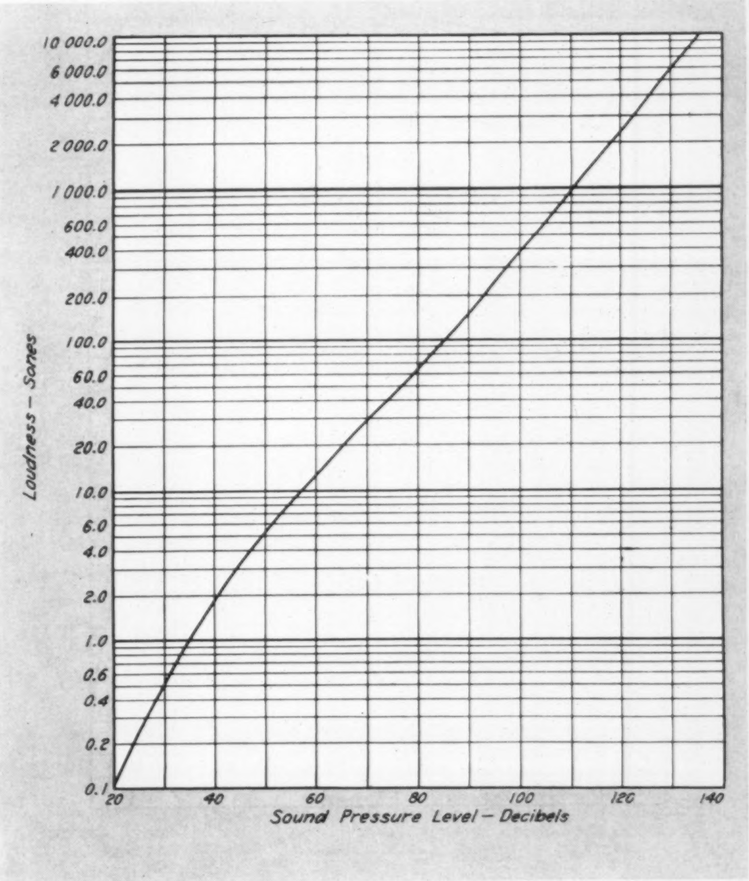
The curves of Figs. 1 and 2 are true for pure—single frequency—tones only. Conventional noise level meters have built-in weighting networks which are intended to make the meter response follow approximately the 40 phon curve or the 70 phon curve of Fig. 1 when desired. That is, a 70 decibel, 50 cps tone would read 40 decibels when the meter is set on the *A* or 40 decibel weighting network. This works out all right for pure tones widely spaced in frequency but not for noise composed of a broad band of frequencies, as most noises are. Because of the masking effects of adjacent frequencies, the ear's response to broad band noise differs from that of the meter.

Beranek and his associates discovered that when the audio spectrum is divided into bands about one octave in width, each band can be considered equivalent to a pure tone equal in loudness and corresponding in frequency to the geometric mean frequency of the band. The loudness, in sones, of each of these bands is determined from Fig. 2 and corresponds to the phon level obtained from Fig. 1 for the decibel level and



Source	Intensity (db)	Loudness in Sones
Pneumatic Riveter, 4 ft	128	3000
Pneumatic Chipper, 5 ft	123	2700
Multiple Sand Blast Unit, 3 ft	115	1600
Automatic Punch Press, 3 ft	112	1100
Nail-Making Machine, 6 ft	111	800
Punch Press, 3 ft	103	350
Extremely Noisy Factory Area	96	215
18" Automatic Lathe	89	127
Old Street Car, 50 ft	83	57
Calculating Machine, 2 ft	77	55
"Quiet" Factory Area	76	54
Automobile, 50 ft	68	14
Household Ventilation Fan	56	7
Residential, Inside, Quiet	42	1

6 TYPICAL INDUSTRIAL and city noises, compared as to intensity levels and loudnesses. Note the inconsistent discrepancy between decibel ratings and loudnesses

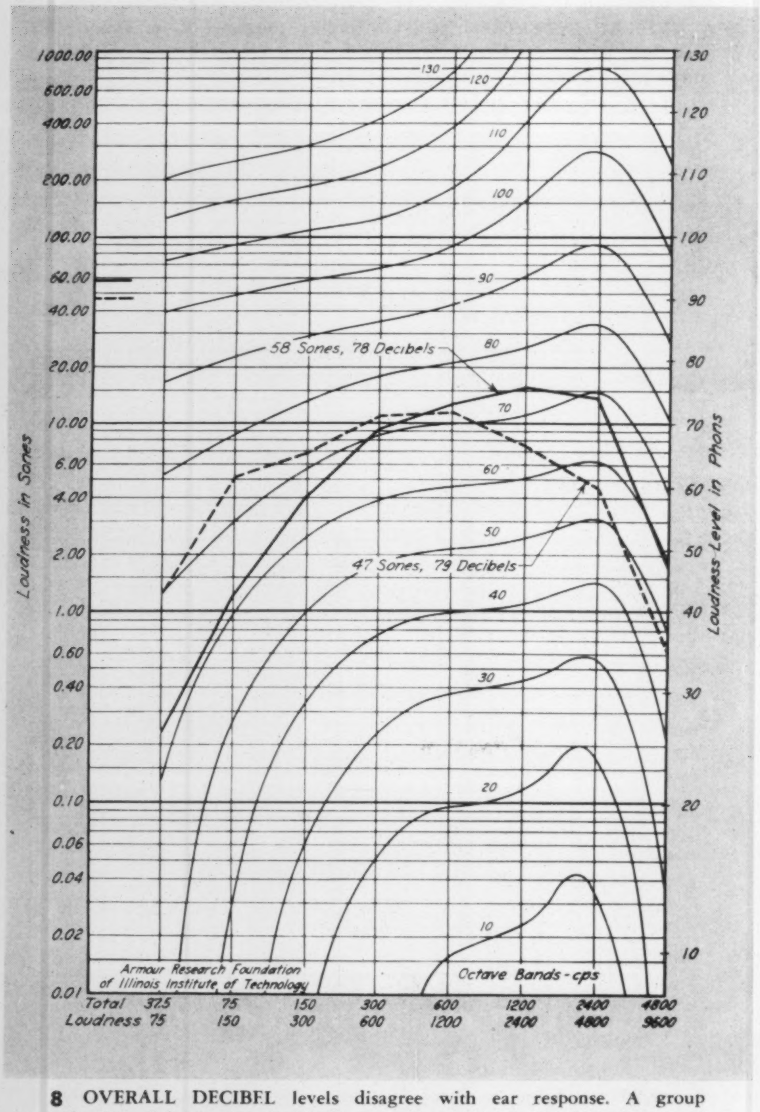


7 "WHITE" NOISE is defined as uniform in sound pressure level across the audio spectrum. Charted here is relation between loudness and sound pressure level for "white" noise geometric mean frequency of the band. The loudnesses of the individual bands can then be added to obtain a total loudness in sones.

Converting Decibels to Sones

Personnel of the Armour Research Foundation simplified the equivalent tone method of determining sone ratings by combining the curves of Figs. 1 and 2 in a single simple chart, Fig. 3. For convenience the audio spectrum is divided into eight octave bands, each represented by a vertical line on the chart. The contour lines represent points of equal sound pressure level in decibels. To use this chart it is only necessary to plot the decibel level of each octave band on the appropriate vertical line and read off the loudness in sones on the left.

The sum of the loudnesses of all eight bands is the total loudness in sones and is indicated by a short horizontal line at the left hand edge of the chart. This is the loudness rating under the equivalent tone method. Note that the two noises plotted in Fig. 3 have loudnesses in the ratio of two to one, although their overall decibel levels are equal.



8 OVERALL DECIBEL levels disagree with ear response. A group judgment of more than 50 listeners confirmed the relative loudnesses of two 30 in. diameter industrial exhaust fans graphed above

The chart in Fig. 3 has an additional feature which is of great value to the acoustical designer. Noise analyses plotted on such a chart indicate the distribution of *loudness* on the audio spectrum in easily understood graphical form. The highest point of the graph is the loudest point; the dominant frequency band is identified at a glance. In contrast, the graph of an octave band noise analysis plotted in the conventional manner—decibels vs. frequency—does not generally have the loudest frequency at the highest point of the graph. The picture of loudness distribution with such a graph is misleading. This point is illustrated very well by a comparison of Figs. 3 and 4.

The preceding paragraphs have defined the sone and stated its value but we still want to know in layman's language, "How loud is a sone?" Figs. 5 and 6 show graphically the sone values of common everyday city noises. The inconsistent discrepancy between decibel ratings and loudnesses is brought out clearly in Fig. 6. An old streetcar at 50 ft is shown to be 6 decibels higher in intensity level than a calculating machine at 2 ft but only 3½ percent louder, whereas an 18 in. automatic lathe is an equal 6 decibels higher in level than the streetcar but 123 percent louder! Again, compare the nail making machine and the automatic punch press. The difference in intensity level is only 1 decibel, but the punch press is 37½ percent louder.

Having defined the sone and comprehended its value, the consulting engineer or architect still wants to know, "How many sones equal a decibel?" As has been reiterated in this article, there is no such rigid conversion factor covering a variety of noises because of the discrepancies between decibel level and loudness. However, a useful relation is given in Fig. 7, which was calculated from Figs. 1, 2, and 3. This chart shows the relation between sones and decibels for a "white" noise, which is defined as a noise that is uniform in sound pressure level across the audio spectrum. It is seen that 20 sones is equivalent to 65 decibels, an easily remembered mid-range set of values. In the usual range of 50 to 95 decibels the slope of the curve is approximately such that a difference of 8½ decibels represents a loudness ratio of 2; that is, double or half loudness. Here we have a convenient relation useful not only for white noise but sufficiently accurate in most cases for the comparison of any two similar noises. "Similar" noises, in this instance, are noises whose sound pressure level vs. frequency curves are similar in shape. Transformer noises with their characteristic 120 cycle hum might be classed as similar to one another, for example. The accompanying table shows additional values of decibel difference for given loudness ratios:

DECIBEL DIFFERENCE for given loudness ratios. For white noise within the 50-95 db range.

Loudness ratio	Db difference
1.25	2¾
1.5	5
2	8½
3	13½
4	17
5	19¾

How to Measure Loudness

Sone loudnesses are determined with the same test setup and equipment used in determining decibel levels, except that a selective octave band pass filter is used in conjunction with the sound level meter so that the decibel level can be read for each octave band. Most manufacturers of sound level instruments incorporate the band pass filter in a sound analyzer, along with amplifier, indicating meter, band selector switch, decade attenuator, and portable battery supply. Octave band analyses require only a few minutes more time than conventional noise level tests.

For best results, the ambient noise level should be at least 10 decibels below that of the noise being tested in each band, although a correction can be applied when this is not possible. The surrounding area should be free of reflecting surfaces which tend to produce erroneously high levels. Well designed quiet rooms take care of both these problems and greatly reduce the time required to make tests.

With large fans it is often necessary to make noise tests outdoors in order to avoid the disturbing high velocity recirculation air currents which would occur within small test rooms. Ambient noises in outdoor testing can be reduced 20 to 50 decibels by interposing a wall with high transmission loss between the test area and the offending noise. A three walled structure open at the top and on one side facing a noise free area provides good all around ambient noise reduction. Of course, the walls must be lined on the inside with an effective sound absorber.

Fig. 8 shows typical octave band loudness plots of two 30 in. diameter industrial exhaust fans, rated 47 sones and 58 sones. A group judgment of more than 50 listeners confirmed the relative loudnesses indicated by the sone ratings. Once again, the overall decibel levels are in disagreement with ear response, being 79 decibels for the quieter fan and 78 decibels for the louder. Such discrepancies are prevalent among fans.

Equivalent Tone Rating Urged

Here at last, we have the basic requirement for a satisfactory sound measurement test code. The equivalent tone method of rating loudness has been tried and proved over a period of three years, and all concerned agree that it seems to be satisfactory in all respects and far superior to the single-figure decibel rating. No one has yet come up with any evidence of inequitable loudness ratings under this method. It has long been known that the decibel level must somehow be tied to the sound frequency or it may be wellnigh meaningless. The equivalent tone method takes care of that with a single-figure rating.

Where it is desirable to identify the dominant frequency, this can be done with a suffix indicating the octave band or bands in which the maximum loudness occurs. Thus, the noise ratings of the two fans of Fig. 8 would be 47-5 sones and 58-6 sones, or 47-45 sones and 58-67 sones, since two adjacent bands are nearly equal in loudness in each case. Such ratings provide sufficient information, in most cases, for the acoustical engineer to select acoustical materials, design mufflers, or apply noise masking techniques. Determination of noise levels can be simplified by loudness meters which can be built to read the loudness of each band in sones directly.

Besides the need for a satisfactory loudness rating, it has been recognized that certain improvements in test code setups and techniques are needed. With wall mounted fans, for example, it is desirable to know the loudness on each side of the wall, indoors and outdoors. Furthermore, there is at present no standardized satisfactory method of measuring noise level within a high velocity air stream, although recent progress has been made in this direction. These are comparatively minor obstacles, however, and present no reason to delay the adoption of an equitable loudness rating system and thus eliminate the source of widespread controversy over the present decibel rating.

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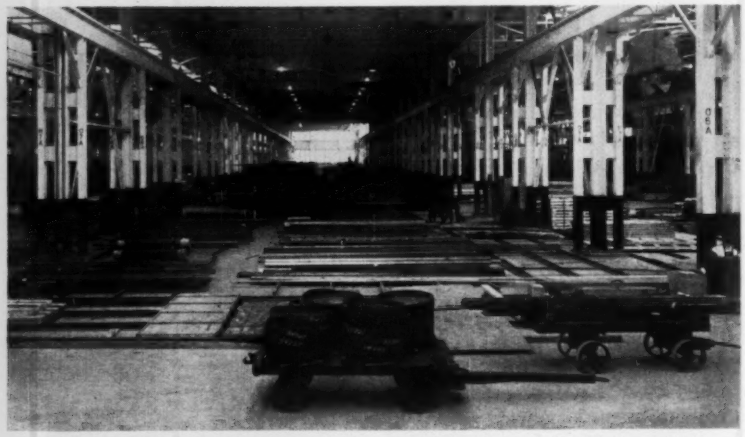
COMPLETE AIR CONDITIONING has been installed in the offices of Ryerson Steel's Chicago plant

They Air Condition Steel

Both personnel and product were considered in this steel service company's program to control humidity and temperature — to increase worker efficiency and morale and to prevent oxidation of stockpiled steel.



SUSPENDED UNIT HEATERS and ventilators, thermostatically controlled, provide desired temperature and humidity for protection of finish and quality of steel in stockpiles

THE STEEL BUSINESS is a good business, especially as steel is the outstanding material of our present civilization.

Joseph T. Ryerson and Son, Inc. was established in 1842 in Chicago, and is a pioneer in this. It now has 15 other offices and warehouses in principal industrial areas. As part of the Inland Steel Co., Ryerson maintains stocks of structural steel, such as beams and angles, shafts, pipe, rivets and sheets all the way from boiler plates to stainless mirror-like alloys.

For a great many years the Ryerson Co. has put special emphasis on the quality and uniformity of all of its products, exercising carefully developed controls at every step in its operations. To preserve and protect the finish and the quality of all steels while in stock, the company has employed various means of controlling the temperature and humidity in its warehouse buildings.

As soon as steel emerges from the rolls and hammers that have shaped it, the ever-ready effect of oxidation becomes manifest. Therefore, steel no longer is stored out of doors at Ryerson.

Warehouses originally were great sheds, with roofs to keep off the rain and snow, but without effective walls as far as resistance to heat flow is concerned.

As later warehouses were built, the heat transfer resistance of the roofs and walls was improved, so that with reduced heat loss it became practicable to prevent oxidation by warming all the air inside each warehouse. This modern construction has involved the building of suspended ceilings above the tops of the cranes in the older plants and installing double windows. Heating is accomplished with recirculating steam unit heaters placed between columns out of the way of cranes and above head level.

Controlling the Humidity

Air conditioning fundamentally includes control of the relative humidity of the air. Warming the steel so that the air which comes in contact with the steel is kept warm enough so that it does not reach its dew point, is therefore a part of air conditioning.

While Ryerson has devoted its first efforts toward controlling air temperatures and humidity for better protection of its steels, it has not neglected air conditioning for its employees. Ryerson offices, in Chicago, St. Louis, Cincinnati, Philadelphia, Milwaukee, Cleveland and other plants have all been provided with mechanical ventilation, and most of them have refrigerated cooling as well. Thus, it is possible to reduce the moisture content of the air in hot weather and to increase it in cold.

How Main Offices Are Cooled

The installation of refrigerated cooling in the Chicago offices is of particular significance because this is the most recent development, and the largest which the company has undertaken. After many years of gradually improving the employee environment in the Chicago plant with profuse ventilation and with some window air conditioning units, Ryerson went all out in the spring of 1954 and installed complete air conditioning consisting of several systems.

"Air conditioning systems were installed in the offices during the spring of 1954"

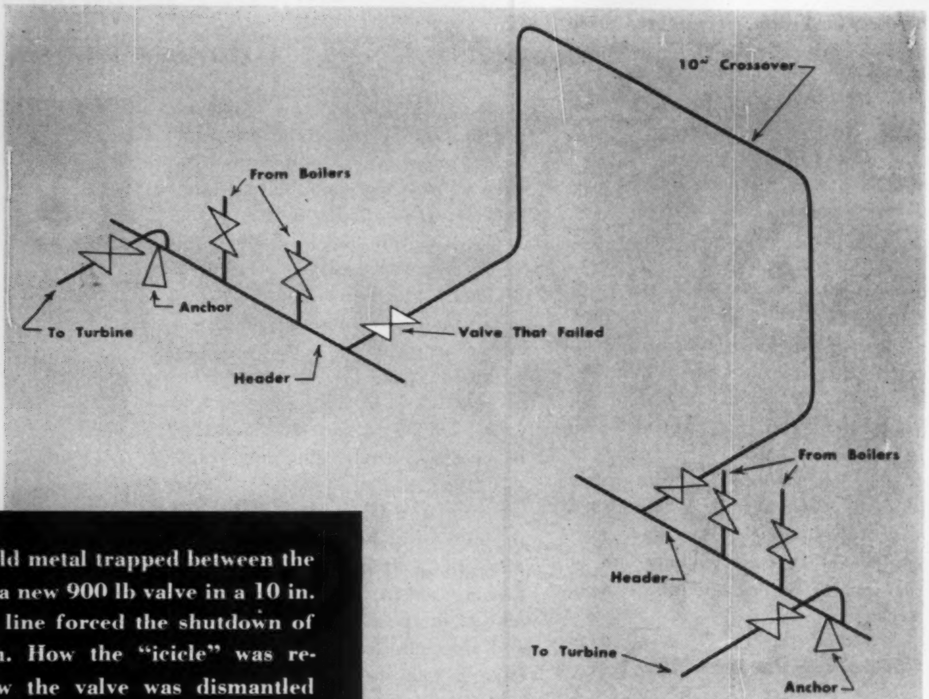
SAMUEL R. LEWIS, consulting mechanical engineer and a member of HPAC's board of consulting and contributing editors, comments informally each month on practical heating, piping and air conditioning problems.

The main office building has three central air supply systems served by a 250 ton capacity centrifugal compressor. Mechanically circulated cold water carries away the unwanted heat. The west office building across the street has a separate 125 ton centrifugal refrigerating plant and the north warehouse office, a block away, has a 50 ton reciprocating condensing plant. Various outlying offices, in the six block long plant, and especially torrid scattered areas, have a total capacity of about 50 tons in self-contained package units.

All temperatures are controlled thermostatically the year around. Provisions have been made whereby any desired proportion of the air may be recirculated, as a matter of economy and comfort. All spent air, which may be odorous and overly warm, is discharged vertically through the roof.

Installation of this cooling system involved some changes in the water, sewer, steam and electrical services, but these were not as great as one might expect, since the ultimate installation of refrigerated air conditioning had been anticipated. The design of the heating and ventilating and lighting equipment, periodically installed for various stories and other additions, always called for clearance for air conditioning equipment.

WORKERS' EFFICIENCY has increased and absenteeism has been reduced, according to H. G. Dent, manager of the industrial engineering division



"Gene's got a ten inch crossover steam valve that he claims he can't close."

• A sliver of weld metal trapped between the disc and seat of a new 900 lb valve in a 10 in. crossover steam line forced the shutdown of a piping system. How the "icicle" was removed, and how the valve was dismantled and reassembled in only half an hour, is told in this article.

Isolation Valve Choked by "Icicle"

By Bill Dopp

• Bill Dopp has had some 40 years of experience dealing with piping, including a long stretch of service as a sales engineer. He is devoting part of his present leisure to drawing on his many piping experiences. All the names are fictitious.

This month, Mr. Dopp's principal character, Martin MacVane, helps correct a valve failure caused, he says, by "unsanitary piping."

Gene Preston, chief engineer of the Dover Electric Light & Power Co., sat in his office discussing a valve failure with Ed Jerome of Jerome and Anderson, consulting engineers for the company. "There was nothing else that we could do, Ed. We had to shut down that unit if we were going to find out what was wrong with that valve. Of course, it gives us a chance to do a lot of other things, too, such as checking the unit itself and so forth. I just can't see the logic in depending on one isolation valve between those two headers."

"You're dead sure that you can't close that valve?" asked Ed, earnestly.

"Positive!" emphatically replied Gene. "Terry McCoy — you know him, salesman for the Valve Co. — was here day before yesterday when we tried it again, and he agrees that there is something wrong. That disc doesn't get within half an inch of getting closed."

"Well, if Terry says so, I guess that's it. He knows his stuff when it comes to valves." Ed shrugged his shoulders. "I still can't understand it."

"Can't understand what?" asked a new voice. Both men looked around quickly, exclaiming together, "Hello, Mac!" With a broad smile the gasket salesman said, "Pardon my interrupting, but that sounded funny com-

> ***". . . For a moment, it looked as if the disc was stuck tight. Suddenly it broke away and the bonnet, stem and disc lifted out of the body . . ."***

ing from Ed. How are you fellows anyway?"

"No wise cracks from you, Mac!" laughed the lanky consultant. "Come on, sit down here and tell Gene what's wrong with his valve."

"Here comes Terry now," exclaimed Gene. "You fellows all know each other?"

Everyone said "hello" as Terry found a chair. He turned to Gene and asked, "Is everything ready?"

"All set to go," declared the engineer. "Let's go down and get started."

"Guess it's time for me to leave," said Mac, as he got up to go. "I'll be seeing you fellows again some time."

"No you don't!" appealed Gene, taking hold of Mac's arm. "Now that you're here, you're invited to Terry's party."

"Stick around, Mac," urged Terry. "I may need your help before I get through with this."

"Well, okay," agreed Mac. "What's this all about?"

Steam Valve Won't Close

"Gene's got a ten inch crossover steam valve that he claims can't be closed," explained Ed. "Terry agrees with him." They started from the office and he continued, "The piping and valve are new. We just put that unit into service. I'll swear there was nothing wrong with any valve when we turned the job over to Gene." He winked at Mac.

"That's the funny part of it," agreed Gene. "We checked every valve in the system and everything seemed okay. But when we tried to close this valve the other day, it just wouldn't close."

"Unsanitary Piping"

"Unsanitary piping," declared Mac laughingly.

The rest stopped short, turning to the smiling visitor. "You can get some of the darndest expressions!" accused Gene. "What do you mean by unsanitary piping?"

"Better explain yourself," demanded Ed Jerome, evidently annoyed.

"I mean dirt in the piping," replied Mac. "Terry's valves are as good as they come. There's something in that valve that prevents it from going to its seat."

"Thanks, Mac," applauded Terry, "for saying something that I hesitated to say myself."

"Listen, you two," blurted Ed sarcastically, "stop building alibis. That piping was very carefully erected and every part was blown out; so, there couldn't possibly be anything in that valve." Ed definitely did not like their suggestion. His resentment flared. "Unsanitary piping indeed!"

"Take it easy, Ed," urged Gene. "You should be used to Mac's crazy expressions by this time. Here we are fellows! There's Terry's nice new nine-hundred pound, chrome molly, pressure seal gate valve that won't close. What do we do now?" he asked, turning to the valve salesman. "Here's Art Colby, top-flight steamfitter and his helper, Jim, to do anything that you want done."

Terry acknowledged the introduction. "All right, boys," he said, "Let's go." He felt the valve yoke gingerly and declared, "Leather gloves for both of you! Got a pair, Jim?" The helper nodded.

"Okay, run that stem down to almost closed. Then loosen those bonnet bolt nuts. You can almost do that by hand."

Valve Is Taken Apart

The others watched silently while the fitters followed directions with speed and precision. "Let's loosen those gland nuts and take off that yoke clamp, Art," suggested Terry. "Next, we'll hit those bonnet studs a sharp rap to loosen the seal ring. That's it! A little harder; you can't hurt it." He paused a moment. "Now Art, take a cold chisel and start that retaining ring to turn. Fine, she's loose. Turn her all the way out." He watched every move, knowing exactly what the next step had to be. Gene moved closer to be in on every detail.

"That's all right, Art. Let the bonnet ring rest on top of the retaining ring." He paused to check the procedure. "Remember, fellows," he warned, "stand back. Whatever you do, don't get your faces over that opening when we get that valve apart. Let's clear this floor over here."

The group, including those who were working, had become tense. Gene glanced at his watch from time to time. "Art," directed Terry," turn that stem down slowly. That's it, easy now." He held up his hand. "A little more. There she comes; steady, but keep going. Fine, the ring is free. Now hold things a minute." He straightened up, looked around, motioning to Jim to move the dolly crane over to the valve. This done, they hooked the chain fall to the handwheel of the valve. "Hoist away!" commanded Terry, cheerfully.

For a moment, it looked as if the disc was stuck tight. Suddenly it broke away and the bonnet, stem and disc lifted out of the body. As soon as it was clear, Terry helped the fitters swing it clear of the valve. Gene looked at his watch again. "Well I'll be darned!" he said in amazement. "Just seventeen minutes." He shook his head. "If I hadn't timed this myself, I simply would not have believed it." Ed grinned with pleasure. Mac chuckled, but Terry was carefully examining the

". . . This piping was as clean as a new watch before we put it into service."

disc. Suddenly, he turned to warn Jim. "Keep away from that open valve!" he commanded sharply. "Jim, never do that," he added more gently. "There may be vapor coming out of that opening. If you get into it, you can be horribly burned. I've seen it happen."

Valve Seat Surface Scored

"Now, fellows, let's take a look at this disc. It's stellite faced and bright as a new dollar." They examined both sides without touching it. "She's still pretty warm, Gene," remarked Terry "Look here at this discolored streak. Something has been pressing against this seating surface. Pretty hard material, too." He slipped a little magnifying glass from his pocket and examined the spot intently. "Doesn't seem to have injured the surface," he said, handing the glass to Gene. Turning toward Ed, he remarked, "That's about the hardest valve seating surface there is. It takes a lot to score it." Mac stood by silently, keenly interested.

"Art, have you got a mirror or a piece of glass that we can use to look into that valve body?" Terry asked the steamfitter.

"Jim, get that little mirror over there on that wall near the control board," the older man directed his helper.

The valve salesman wiped the mirror clean with his handkerchief and gingerly held it over the open valve. Condensation quickly covered the surface. In a moment this cleared away and the interior of the valve became visible in the light of the extension lamp. Terry studied the scene thoughtfully. "Gene, look here. Do you see what I see?" He held the mirror steady, while the engineer crouched down to get a better view.

"Looks like something is plastered up against the low side of the disc well there, Terry. Move that light." He crouched closer. "I'll say there is. Come here, Ed. Take a look at this." Ed took his place as he straightened up. "Guess you are right, Mac," he said.

"What is it?" asked Mac.

"I don't know," answered Gene. "Seems to be a long piece of metal of some kind. Do you see it, Ed?" he asked the crouching engineer.

"There is something there all right, but I can't make out just what it is."

Find "Icicle" in Valve

Mac stooped down at a silent signal from Terry to get a look at the object. He studied it in the mirror for a few moments. Looking up at Terry he winked. "Icicle" he said shortly.

"It can't be!" almost shouted Ed, who had heard the remark. "I told you this piping was as clean as a new watch before we put it into service. That must have been in the valve," he declared vehemently.

"Calm down Ed," Gene urged quietly. "You're not to blame. Something could have gotten into that pipe. Let's wait until we see what this really is."

Mac had been talking quietly with Terry and Art. Jim came up with a couple of burlap bags. The salesman borrowed a glove from Art, wrapped his arm in the burlap and adjusted the light so that he could see into the valve from above and to one side. "Do you think she is cool enough?" he asked Mac. The gasket salesman passed his hand across the opening fairly high up. "I think you can make it," he agreed. "Better be quick."

Terry cautiously placed his gloved hand on the valve but withdrew it in a moment. Then he held a piece of paper over the opening. Nothing happened. "I'm going to try it," he declared. Getting close to the opening, with his face turned away, he put his hand quickly down into the valve. Closing his eyes, he fumbled for a moment, then rapidly withdrew his hand grinning broadly. "Got it! Wow, that's hot," he exclaimed as he held it up. "Mac's right. It's an icicle and a big one, too." As Ed reached for it, Terry warned "Look out, Ed, that's pretty warm!"

They all examined the object as he turned it over and over. "That thing must be all of three inches long and one-eighth of an inch thick at the one end," declared Gene. "Look at the way it's bent in the middle. Almost at right angles."

"You can see bright spots here where the seat and disc were bearing on it," pointed out Terry. "This is what was holding that valve from closing," he said. "I just hope it hasn't injured that seal ring."

Seal Ring Is Not Injured

"I doubt that it has, Terry," said Mac. "You can hardly see where it touched the disc. If it had injured the ring, I'd look for scratches on the disc because that must have moved across it while it just lay against the ring. Better wait until the valve cools and be sure." He surveyed the valve parts still hanging on the chain hoist. "How long will it take to put that valve together again, Terry?"

"About fifteen minutes, Mac. I've examined the seal ring and it's in perfect condition. Nothing to it now, if the valve has not been injured," he replied confidently.

"I don't believe it yet," declared Gene emphatically. "Why, it used to take us half a day to get a nine-hundred pound valve open, and half again as long to bolt it up again, didn't it, Art? Seventeen minutes to get that thing apart, and this bird says he can get it together again in one-quarter of an hour!" He shook his head doubtfully. "What changes time does bring."

"This is the first time I've seen one of those new valves taken apart," declared Art. "I'm glad I had the chance. Now if anything happens to one of them, I'll know how to go

". . . Foreign matter . . . is the source of nearly all of our troubles with valves that are properly applied . . ."

about it." He smiled with satisfaction.

"Ed's still nursing a grudge," laughed Terry, as he handed the now cool sliver of welding metal to Mac. "Where do you suppose that came from?" he asked.

Mac gazed thoughtfully at Ed before he answered. "I take it that all of the joints in this piping were made with welding rings," he said. Gene nodded. "Then there is only one place that it could have come from. That's the boiler." Ed turned quickly, as though to interrupt, but evidently thought better of it. He stood a little apart, eyeing the group.

"That boiler was washed out and blown out for days, Mac," contended Gene. "I don't quite see how this thing could have come from there."

"When you consider the hundreds of welds that go into a big boiler and the inaccessible places where something like this could come from, it's not so surprising. Once the water and steam get to moving at high velocity, anything that gets loose is apt to be carried into the outlet piping and from there into the system." Mac paused, looking over at Ed. "Even Ed acknowledges that possibility when he insists on installing a strainer in front of his turbine and ahead of every trap."

"I learned what can come out of a clean boiler recently," attested Terry. "We had a big angle stop check valve on top of a huge boiler that got stuck tight, in the open position. When we finally got that baby open, everyone was horrified at the amount of welding pellets, scale and other debris that had been forced into the valve around the piston. A few of those had found a lodging at the piston edge and beautifully jammed it. We had to open that valve twice, before we got rid of all that stuff." He turned toward Ed, who had again joined the group. "That's no reflection on the boiler people, Ed. They had done all they could to clean that boiler. I think it's just one of those things that we have to be careful about."

See the special
Show Section
on page 197
for information
on the
"Big Week"

"A lot of things happen in piping that we don't like," asserted Mac. "Certainly we don't know all of the answers. Take this high pressure piping for instance. It won't be long before the inside of it is completely coated with black oxide of iron. That does no particular damage, unless it begins to accumulate somewhere. Then Terry will have another valve to open. Sometimes, it gets on seating surfaces, starting leaks that end up in wire-drawing."

Foreign Matter Thwarts Valves

"Foreign matter — matter that doesn't belong in the piping system — is the source of nearly all of our troubles with valves that are properly applied," affirmed Terry with deliberate emphasis. "Hard substances, like this icicle, or rust and oxides that Mac spoke of, can and do cause many of the failures of valves to give the service that is expected of them." He pointed to the open valve. "I've seen expensive valves like that one so full of junk that you couldn't get the disc down to the bottom of the opening."

"To say nothing of such things as lunch boxes, nails, hammers, and what not," added Mac, cheerfully.

"Valves were made to do certain services in a pipe line. They are not intended to cut nails or anything else. A single valve can cost as much as a fancy automobile. It deserves just as much care and attention as you would give your car." Terry aimed a finger at Gene to add force to his remarks.

"What caused this thing to lodge in that particular valve?" asked Art diffidently.

"That valve is located on the side of the header instead of on top like the others. Gene told me that he had put the crossover into service last week. The piece was probably lying on the bottom of the header. When steam began moving into the crossover, the sliver was shoved along until it fell into the valve disc well. Then, when they tried to close the valve, the disc couldn't get to its seat."

"That valve at the other end of the crossover is evidently perfectly tight," said Ed. "I'm satisfied that this valve is probably all right too, now that this thing is out of there." He turned to Terry. "You'll check the seal before you close it up, I'm sure. Thanks for being here today."

"Whenever a valve begins to balk, I want to be around. I think I know their language and can usually find the remedy for their complaints," laughed Terry. "Mac has been in on a lot of these things, too. I'm glad you were here today," he told his friend.

"So am I," said Gene. "This has been quite a party. I'll see that Terry stays until we get that valve back into service," he chuckled. "I'm still amazed at the speed with which it can be done."

"Come on, Mac," said Ed. "I still don't like your 'unsanitary piping,' but I'll give you a lift just the same."

Do We Need a Standard Form for Air Conditioning Calculations?

"Yes," concludes forum session at ASRE meeting

A FORM FOR air conditioning load calculations that will give information on the operation of a system under both maximum and minimum conditions should be developed, it was concluded at a forum session held during the 50th annual meeting of the American Society of Refrigerating Engineers, in Philadelphia. Those in attendance voted to recommend that a committee be appointed — perhaps in cooperation with the American Society of Heating and Air-Conditioning Engineers, the Heating, Piping and Air Conditioning Contractors National Association, and the Air-Conditioning and Refrigeration Institute — to develop such a form.

H. M. Hendrickson — of the department of mechanical engineering at the University of Washington — served as moderator of the forum. He pointed out that it is difficult for an outside engineer to go into an engineering office to check air conditioning calculations, as each engineer "seems to use his own scheme" for recording design data. A standardized form would simplify the problem, he felt.

Cover Partial Load?

W. T. Smith, Jr., of Air Force headquarters, said that such a form should cover partial load as well as full load conditions, as designs must be checked for proper performance at other than the full load.

The Air Force will have to develop its own form to provide for partial load calculations if the air conditioning industry doesn't do so, said Mr. Smith. "One would be amazed at when the maximum load comes on an officers' club air conditioning system," he said, "because of the change of occupancy from the cocktail lounge to the dining room and then to the ballroom."

Two other engineers at the meeting who are particularly concerned with industrial air conditioning reported that it was their practice to make both maximum and minimum load calculations. One company with several laboratory air conditioning installations requiring "pin-point" control makes such calculations on jobs as small as 1½ hp capacity.

Long or Short?

"Long form" versus "short form" load calculation sheets were discussed. Mr. Smith said that the "ultimate in short forms" was the use of the figure of 250 sq ft of floor space per ton of refrigeration" for air conditioning.

E. P. Palmatier, of the Carrier Corp., stated that the air conditioning industry is tending away from rather than toward short form calculations. Each type of building presents an entirely different air conditioning problem, he said, and "as we refine our engineering, we are going to an entirely different calculation for each type of job." Charles Randolph, of the Wisconsin Electric Power Co., mentioned that "the shorter the form, the smarter the user has to be to employ it properly."

A member of the group brought up the problem of over-estimating air conditioning loads, and stated that loads are over-estimated by 30 to 40 percent because of the assumption that solar radiation is cooling load. It is not, he stated, unless it becomes convected heat.

Credit for Heat Storage?

Wirt S. Scott, of the Philadelphia Electric Co., commented on heat storage. In one building, the outdoor weather didn't affect the air conditioning equipment for 24 hr, he said, and in another for 48 hr. But one summer, when for six days the temperature during the day rose to above 95 deg, the air conditioning compressors had to operate day and night. He would therefore be hesitant to reduce the capacity of air conditioning installations by taking too much credit for heat storage of the building construction.

Other Meeting Highlights

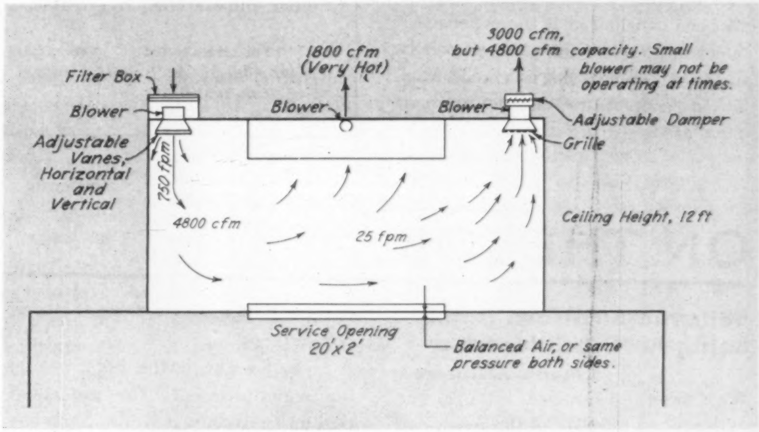
Included in the technical program were conferences on education engineering (specialized versus generalized curricula), water conservation, domestic refrigerator engineering, air conditioning, and desiccants.

A research program development symposium held during the meeting faced the questions of: Does the ASRE need a real research program? What theoretical and practical projects should be sponsored? Where should such research projects be conducted and how should they be administered?

A highlight of the convention was the presentation of a "time capsule" to be opened in 2004 A.D. containing microfilm and actual photographs and records which record the state of refrigeration as of 1954.

QUESTION OF THE MONTH

How Ventilate Cafeteria Kitchen?



1 KITCHEN MAY BE VENTILATED in this way

THE QUESTION, *How To Ventilate Large Cafeteria Kitchen?*, was published previously in HPAC and is repeated here for information along with two answers to the question that have been received from HPAC's readers. Other comments for publication will also be welcome.

"An extensive and complete ventilating system was installed when a modern cafeteria was built three years ago, but the 41 burners in the kitchen, when operating, proved to be too much for the system. The temperature in the kitchen is unbearable for the four cooks, bakery personnel and other occupants. What is the best approach in revising an existing ventilating system in a cafeteria kitchen so that it will perform satisfactorily? I would like to use refrigerated spot cooling to help solve this problem, but it would take many tons of refrigeration capacity to remove the burner heat alone. There must be some more practical method than this. I would appreciate seeing how other HPAC readers have attacked similar problems."

D. R. SHEARER —

"Plan Rapid Air Changes and Balanced Pressure"

IN MY OPINION and experience, the best way to ventilate a large kitchen is to maintain rapid changes of air admitted from the outside and carry a balanced air pressure in the service opening between the kitchen and cafeteria. This can be done by using three blowers, with a damper control on one.

One blower introduces filtered outside air, another exhausts air from the hoods, and the third exhausts to the outside through an adjustable damper. With kitchen air balanced against cafeteria air, the latter may be refrigerated with little loss to the kitchen. Incoming air must be deflected and diffused by four-way vanes to eliminate cold drafts.

For example, if the kitchen is 40 ft × 20 ft × 12 ft, or 9600 cu ft in volume, and the air is changed once every two minutes, the flow rate of air introduced into the kitchen would be 4800 cfm. If the hood exhaust rate is 1800 cfm, then 3000 cfm must be exhausted through the blower by damper adjustment. A 6 in. × 1 in. strip of tape hung in the service opening will hang straight down when air is balanced or indicate flow in either direction.

An automatic control to maintain balance by damper movement could be used if justified. See Fig. 1. — D. R. Shearer, Consulting Engineer.

JOHN BELUNAS —

"Need Answers to These Questions First"

TO REVISE an existing ventilation system so that it will perform satisfactorily is no simple problem. The words "extensive and complete" give no indication as to floor plan, duct layout and other factors which would be of value in making suggestions for improvement of the system.

Because of this, I have been asking myself questions, which may be of help in improving the performance of this system:

1. Is every burner *effectively* covered by an exhaust hood to remove the heat as it is generated?
2. Are these hoods and the ductwork frequently and thoroughly cleaned so that no accumulation of dust and grease is restricting air flow?
3. Has the exhaust blower been speeded up as much as possible?
4. If there are supplementary window exhaust fans, are they pulling heat away from the burners and into the working area?
5. Are the windows in which the supplementary fans are located kept closed, so that there will be no short-circuit of the air flow?
6. Are the air filters on the air intake side replaced frequently to allow a free passage of outside air?
7. Is the air intake too small; if so, has its effectiveness been increased by the addition of a blower?
8. Is the air being distributed properly; does it come down over

the work areas and leave by the exhausts?

9. Is the roof directly overhead; if so, is it cooled by water sprays?

10. Is there a cheap source of water to run through cooling coils in the air duct?

11. Assuming that there is proper air distribution, has the cost of delivering refrigeration-cooled outside air been considered as too expensive? Such may not be the case, especially since the air need not be cooled to as low a temperature as required in other areas.—JOHN BELUNAS.

READER ASKS —

"How To Install Piping for 40 to 125 psi Steam Boilers?"

"We install boilers and piping systems for heating, processing, cooking, etc., in hospitals, institutional buildings, process and other industrial plants. We would like detailed information on the proper practice for making the piping connections for steam, feed water, etc., where 40 psi and 125 psi steam boilers are used. Descriptions of the best practice for these intermediate pressure systems, with sketches or other illustrations, if possible, would be most helpful."—J.M.B.

[*You are invited to comment on this question, giving actual examples if possible. Address the Editors, Heating, Piping & Air Conditioning, 6 N. Michigan Ave., Chicago 2.*]

ON THE JOB

Bellevue-Stratford Hotel Being Air Conditioned

. . . meeting headquarters

WAY BACK IN January 1906, at the 12th annual meeting of the American Society of Heating and Ventilating Engineers (now the American Society of Heating and Air-Conditioning Engineers), William G. Snow presented a paper on the heating and ventilating features of the Bellevue-Stratford hotel, Philadelphia. This month, the society holds its 61st annual meeting at the Bellevue. During the meeting, the work of installing air conditioning in the hotel will be going on.

The installations for the public rooms have been completed, and just last month work started on the first of nine guest room floors to be air conditioned. The entire project, including conversion of the building to alternating current, will cost some $1.7 million.

Two motor driven centrifugal refrigerating machines — of 600 and 800 ton capacity — in the basement will furnish chilled water to 41 air handling units throughout the building, there being two of these units on each guest room floor. Installation of the piping was simplified, as there was an old vent shaft running up through the building from the basement. A cooling tower on the roof furnishes condensing water. On the guest room floors, the conditioned air ducts will be installed along the corridor ceilings.

J. A. Keenan is the hotel's building superintendent. The air conditioning contractor is Kerby Saunders, Inc., New York. Consolidated Air Conditioning Co., Philadelphia, is installing the ductwork.

Philadelphia's Inventory Of Air Conditioning

. . . shows rapid growth

THE FIRST of Philadelphia's multi-story office buildings to be air conditioned totaled 1000 tons in 1932. Since then, 27 other multi-story office buildings in the city have been conditioned, according to the Philadelphia Electric Co. An additional 15 assured installations, either now in progress, or for which contracts have been let, or for which plans are now in preparation, will add 12,500 tons.

In another category — that of commercial and industrial installations — prior to 1944 there were an estimated 2600 installations totalling 55,000 tons. All of these installations consist of central plant and self-contained units. The yearly increases above each preceding year are as follows: 1945, 85 percent; 1946, 181.9 percent; 1947, 41.5 percent; 1948, 50.6 percent; 1949, 7.1 percent; 1950, 86.0 percent; 1951, 26.8 percent *decrease;* 1952, 6.9 percent; and 1953, 94.2 percent.

In addition, there were approximately 8500 tons of capacity in room air conditioning units installed in commercial and industrial establishments as of December 31, 1953. During the year 1954, an estimated 5000 tons were added, making a total of 13,500 tons.

TABLE 1—SUMMARY of the development of air conditioning for multi-story office buildings in Philadelphia since 1932, now connected to the Philadelphia Electric Co. system

Year	Buildings	Tons
1932	1	1000
1946	1	700
1947	1	120
1949	2	810
1950	1	400
1951	1	600
1952	3	750
1953	8	3875
1954	10	6253
Total connected	28	14,508

Air conditioning jobs now being installed, contracts let or consulting engineer preparing plans and specifications:

Number of assured jobs	15
Total tons	12,500

TABLE 2—GROWTH IN NUMBER AND TONNAGE of commercial and industrial air conditioning installations in the Philadelphia Electric Co. territory

Year	No. of Installations	Tonnage Installed
Estimated prior to 1944	2600	55,000
1944	66	1931
1945	122	1151
1946	344	9249
1947	486	6977
1948	732	9251
1949	785	8771
1950	1460	19,860
1951	1069	9954
1952	1143	10,274
1953	2220	21,701
1954	2400	22,000
Grand total	13,427	176,119

Heat Loss Curves Aid In Specifying Economical Insulation Thicknesses

THE HEAT LOSS curves on the following page have been developed by the Industrial Mineral Fiber Institute, Inc. to help the engineer in determining economical thicknesses of mineral wool blanket insulation.

To use the chart, start at the hot surface temperature on the scale at the lower left and proceed vertically to the given insulation thickness on the curves at the left. A horizontal line through this point intercepts the vertical scale in the center at both heat loss per hour in Btu per square foot and heat loss per year in million Btu per square foot for continuous operation. The annual heat loss may be adjusted proportionately when the operation is not continuous. Follow with a line through heat loss on the center scale and through cost per million Btu on the slanted scale to meet the righthand scale at the approximate annual cost of heat loss in dollars per square foot.

For each particular insulating job, hot surface temperature and the cost of heat are constant, so that insulation thickness only can be varied — presuming that the types of insulation and finish remain the same.

Then select two or three reasonable insulation thicknesses and determine the corresponding annual cost of heat loss with each. Knowing the difference in total installation cost between the various thicknesses, the specific operating cycle and the company's depreciation rate, the most economical insulation thickness can be determined. Of course, the chart can also be used to determine heat loss alone, from both bare and insulated surfaces.

Typical Example Applied

Assume that the most economical insulation thickness for a heated vessel operating continuously at 660 F and at a fuel cost of \$0.40 per million Btu is desired. By applying the curves — as shown by the dotted lines — the heat loss costs for insulation thicknesses of 1 in., 2½ in., and 3 in. are obtained. The added cost of materials and labor are then tabulated to provide the total costs of these three thicknesses. Thus, it may be seen that the 2½ in. thick insulation would cost \$0.25 more per square foot when installed than the 1 in. thickness.

It is evident that the 2½ in. thickness is more economical than the 1 in. since the heat savings per square foot are \$0.17 greater in the first year than the total added installation cost. A thickness increase to 3 in. saves \$0.05 more per square foot each year but costs \$0.15 more to install than the 2½ in. The added ½ in. of insulation would take three years to pay for itself at the assumed fuel cost of \$0.40 per million Btu. Thus, selection of insulation thickness would in this case be governed by the anticipated life of the equipment involved. Using the bare surface heat loss scale at the lower left, it is evident that the heat loss at 660 F is about 3000 Btu per sq ft per hr, with an 80 F ambient air temperature. This represents a cost of about \$10.50 per sq ft per year.

Background of Chart Explained

The curves in the chart have been developed by using the expression:

$$U = (t - 80)/[(x/k) + (1/c)] \quad \ldots\ldots\ldots (1)$$

where t = hot surface temperature, F; 80 F = assumed constant ambient temperature; x = insulation thickness, in.; k = thermal conductivity of insulation, Btu per hr per sq ft per in. per F; c = surface conductance factor assumed to be constant at a typical value of 2. The thermal conductivity is obtained by the following expression:

$$k = 0.252 + 0.00035t \quad \ldots\ldots\ldots\ldots\ldots\ldots (2)$$

These values represent typical design values for mineral wool blanket insulation at mean temperatures from 100 F to 600 F. The temperature of the outside of the insulation surface is assumed to be constant at 120 F in converting mean temperature to hot surface temperature in Equation 2.

Because of the several assumptions made, the curves cannot be expected to be more accurate than ± 15 percent, although most results — with reasonable thickness of insulation — will be close enough to actual values for practical purposes. Of course, when the curves are used on a comparative basis, the degree of accuracy is increased.

SELECTED DATA from chart on following page

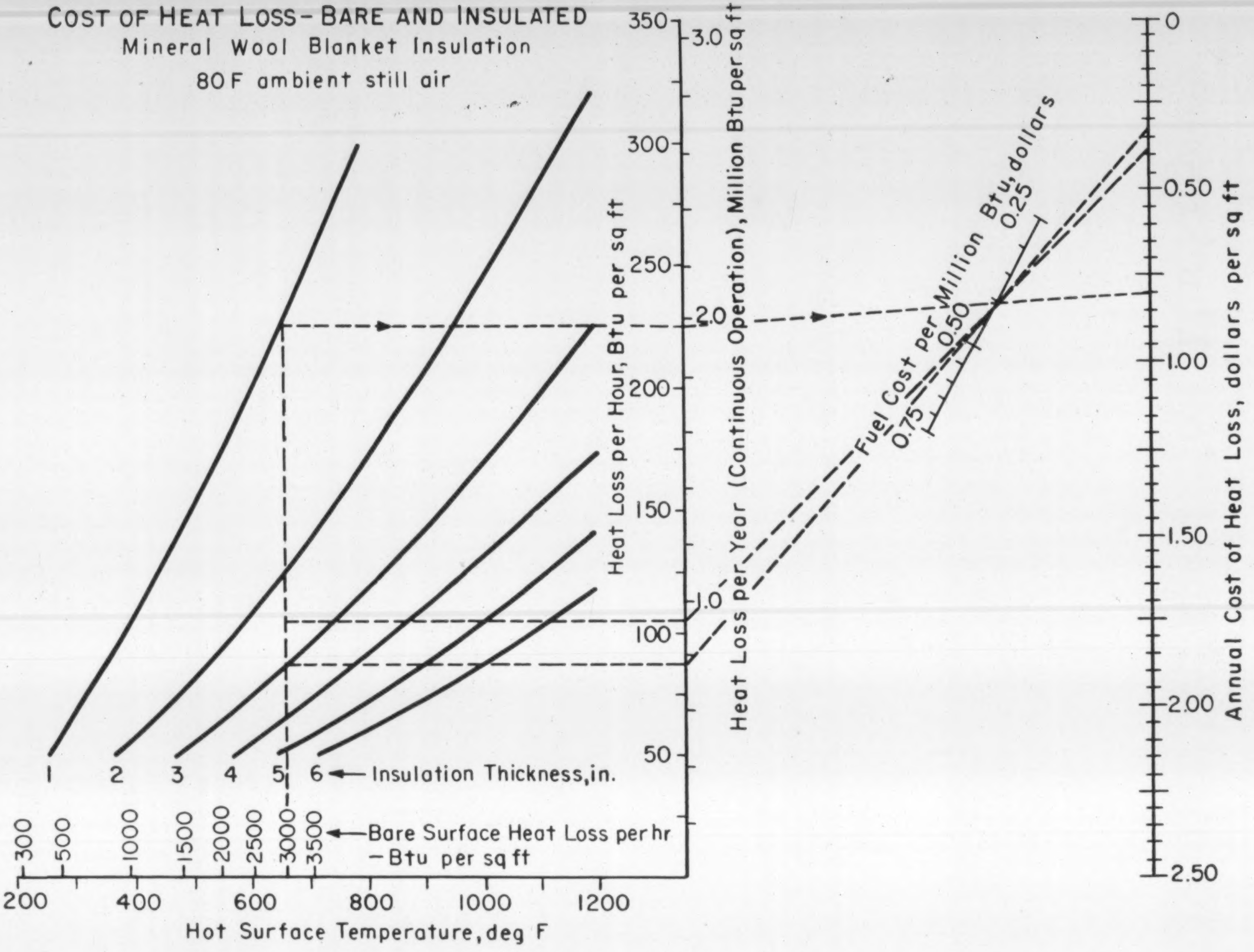
Insulation thickness, in.	Annual cost of heat loss,* \$ per sq ft	Annual heat savings over 1 in. thickness, \$ per sq ft	Total material and installation cost—approx.—over 1 in. thickness, \$ per sq ft
1	0.80	—	—
2½	0.38	0.42	0.25
3	0.33	0.47	0.40

*From curves on following page

COST OF HEAT LOSS – BARE AND INSULATED

Mineral Wool Blanket Insulation

80 F ambient still air



SHOW SECTION

Philadelphia
January 24 — 28

Complete Information on the "Big Week" — Program of the Meeting, What's on Exhibit, Layout of the Show

Air Conditioning Exposition — 12th International Heating & Ventilating Exposition . . . . 61st Annual Meeting of the American Society of Heating and Air-Conditioning Engineers

Quick Picture of the "Big Week"

ASHAE MEETING . . . .
Technical sessions at 9:30 a.m. Monday, Tuesday, Wednesday and Thursday at the Bellevue-Stratford hotel. See program for full information. Special meeting Saturday, January 22, to consider a by-law amendment.

EXPOSITION . . . .
Opens Monday at 2 p.m. at the Commercial Museum, and daily Tuesday through Friday at 12 noon. Closing hour is 10 p.m., except on Friday at 6 p.m. See list of exhibitors and diagram of the exposition layout for full information on "who, what and where."

THE LIGHTER SIDE . . . .
ASHAE Welcome tea, Sunday at 4 p.m. at the Bellevue-Stratford . . . . Welcome luncheon, 12:15 on Monday at Bellevue-Stratford . . . . Bus trips for ladies at 2 p.m. . . . . "Delaware Valley, U.S.A. Frolic", buffet supper, show and dancing at Benjamin Franklin hotel, Monday at 6 p.m. . . . . Luncheon for ladies at Bellevue-Stratford and bus trip to Longwood Gardens, Tuesday, 11 a.m. . . . . ASHAE Past Presidents' dinner, Tuesday, 7 p.m., at Union League . . . . Luncheon and fashion show for ladies at Warwick hotel, Wednesday at 12:30 . . . . Annual ASHAE banquet at Bellevue-Stratford, Wednesday at 7 p.m. . . . . Bus trip for ladies to Atlantic City and luncheon at Haddon Hall, leaving Thursday at 10 a.m.

A Big Show and a Big Meeting

Historic Philadelphia Becomes the Center of Modern Heating, Air Conditioning This Month

THE 61ST ANNUAL Meeting — and the first under its new name — of the American Society of Heating and Air-Conditioning Engineers, Inc. (formerly The American Society of Heating and Ventilating Engineers) opens officially at the Bellevue-Stratford hotel, Philadelphia, at 9:30 a.m., Monday, January 24. At 2 p.m. the same day, the 12th International Heating and Air Conditioning Exposition, sponsored by the ASHAE, opens at the Commercial Museum with over 400 manufacturers exhibiting the latest in heating, air conditioning and ventilating equipment.

Notice has been given to ASHAE members of a special meeting of the society on Saturday, January 22, at 2 p.m., in the Bellevue-Stratford, to consider a proposed by-law amendment to Article IV, Section 4, relating to publications. If approved, it will be presented for final adoption at the first session of the annual meeting on Monday.

Four Technical Sessions

Technical sessions of the Society will be held each day, Monday through Thursday, starting at 9:30 a.m. Except for the Monday meeting in the Clover Room of the Bellevue-Stratford, all sessions will be held in the ballroom.

The Exposition will be open each day through Friday until 10 p.m. except the last day, when it closes at 6 p.m. The opening hour each day is 12 noon, except for the Monday opening at 2 p.m. There will be special bus service from downtown hotels.

An excellent selection of technical papers for the four technical sessions has been arranged by the Society's Program and Papers committee under the chairmanship of B. H. Spurlock, Jr., professor, Department of Mechanical Engineering, University of Colorado.

The first paper, by C. P. Yaglou, professor, Industrial Hygiene, Harvard School of Public Health, is a report on experimentation in determining the ventilation requirements necessary for removing tobacco smoke from a room. Tests showed that when less than 15 cfm per smoker of outdoor air is introduced, occupants complained of eye sting, headache, coughing and nose irritation.

In a paper to be presented by K. T. Whitby, the use of a centrifuge for measuring the size, distribution and amount of dust particles in a given air sample will be described. The paper deals with the apparatus used, the method and the basic theory of the test. A future paper is to describe the results of the application of this method of measuring dust particles.

H. A. Endres will read the closing paper of the Monday morning session. It was prepared by Mr. Endres, W. T. Van Orman and R. P. Carter, Jr., and describes a method of testing panel type air cleaners under "use conditions". They feel that passing a synthetic test dust through the air cleaner does not give as effective a test as when using real dust under actual working conditions.

The first paper Tuesday morning, to be delivered by L. F. Schutrum, research supervisor at the ASHAE Laboratory, was written by John Vouris, T. C. Min and Mr. Schutrum as an ASHAE Laboratory paper on panel heating and cooling. It includes a description of temperature distribution in a room cooled by ceiling panels and observations on how rooms cooled this way are the inverse of rooms heated by a warm floor.

Another ASHAE Laboratory paper, by A. Umur, G. V. Parmelee and L. F. Schutrum, is a report on the measurement of angular emissivity. It describes the equipment set up for measuring the heat absorbing properties of materials such as copper and paints and effects of radiation at various angles. Up to 50 deg from a perpendicular, angle made no difference on practically all materials — but beyond 50 deg the ability to absorb heat lessened as the angle widened.

The final Tuesday paper, by H. B. Nottage and G. V. Parmelee, is also an ASHAE Laboratory paper and deals with a continuation of the study of the basic problem in which the heat load is determined by the application of electric circuits to the principal sources of heat in a building. The paper explains how, in calculating heat loads, an electric circuit can be used as a source of heat.

A discussion of the thermal conductivity value of gas in insulating materials is the subject of a paper prepared by R. M. Lander and scheduled for the first presentation Wednesday morning. By substituting other gases, such as carbon dioxide and "Freon," for air the author was able to show that the thermal conductivity of the materials decreased and the insulating property improved when the change was made.

M. L. Ghai and R. Sundaram will report a study of the commonly used method for measuring heat loads and believe it can be improved by making use of an outside design temperature which is a synthetic temperature arrived at by combining construction material characteristics with actual weather temperature.

Describing the study of liquid-to-liquid transfer of heat, F. W. Hutchinson, L. J. La Tart and N. W. Smith will tell of their laboratory equipment set-up for measuring the amount of heat which passes through a water heater when the water is moving fast on the inside and slowly on the outside of a tube. The data will be helpful in predicting the amount of surface needed in hot water heaters used for this purpose.

A study of the amount of solar radiation realized on cloudless days makes up an ASHAE cooperative paper, which is the last to be delivered on Wednesday. Prepared by R. C. Jordan and J. L. Threlkeld, it tells of work done at the University of Minnesota on a study of the amount of heat received from the sun by horizontal and vertical surfaces from a southerly direction at different angles.

An ASHAE cooperative paper with Case Institute, by Alfred Koestel, will be the first presented at the concluding session Thursday morning. It correlates studies made of the path of heated and cooled jets of air projected horizontally. Professor Koestel has worked up an equation for predicting this path.

In discussing the air conditioning of multi-room buildings, R. W. Waterfill feels that a suitable installation is a central heating and cooling system which uses a double-duct system handling air at different temperatures which are mixed at the point of usage. He will give a paper on this subject Thursday.

A report on the installation of a summer cooling unit in a residential structure at the University of Illinois, prepared by H. T. Gilkey and S. Konzo, presents a record of the changes which took place when the unit was operated constantly and intermittently. It was found more moisture is removed during intermittent operation and that increasing the amount of air by use of a faster speed did not change the effect materially. It also was learned that the load on the installation seemed related to the amount of time the outside temperature exceeded 65 F.

Many Special Events

The Committee on Arrangements — headed by general chairman John McElgin, of the Philadelphia chapter — has arranged several special events, beginning with a Welcome Tea Sunday afternoon.

There is a Welcome Luncheon, to be addressed by Joseph S. Clark, Jr., Mayor of Philadelphia, at 12:15 Monday, and that night an evening of fun — Delaware Valley, U. S. A. Frolic. At the Annual Banquet Wednesday evening, the new officers will be installed, Charles S. Leopold will receive the F. Paul Anderson Medal, L. N. Hunter will receive the past president's emblem and the speaker will be Dr. Milton S. Eisenhower.

All week long there also will be special events for the ladies.

Live Exhibits at Booth

At the Exposition, the Society will have Booth 68 featuring the research, publication and membership activities of ASHAE. In addition there will be several "live exhibits" including a centrifugal sedimentation apparatus which can measure dust particles of 1/100,000 of an inch.

Hotel reservations are high and still climbing and it is expected that attendance at the Annual Meeting and the Exposition will set a record.

Program

for the 61st Annual Meeting of

American Society of Heating and Air-Conditioning Engineers, Inc.
Bellevue-Stratford Hotel • January 24-27, 1955 • Philadelphia

(All meetings at the Bellevue-Stratford unless designated otherwise)

FRIDAY — JANUARY 21

9:30 a.m. Executive Committee (*Room 105*)
1:30 p.m. Finance Committee (*Room 105*)

SATURDAY — JANUARY 22

9:30 a.m. Council Meeting (*Blue Room*)
2:00 p.m. Special Meeting to consider proposed by-law amendment
2:00 p.m. Research Executive Committee (*Room 104*)

SUNDAY — JANUARY 23

10:00 a.m. REGISTRATION (*Lobby Floor—Burgundy Room*)
10:00 a.m. Committee on Research (*Red Room*)
4:00 p.m. Welcome Tea (*Burgundy Room*)

MONDAY — JANUARY 24

9:00 a.m. REGISTRATION (*Lobby Floor — Burgundy Room*)
9:30 a.m. FIRST TECHNICAL SESSION (*Clover Room*)
Call to Order by Pres. L. N. Hunter
Report of Officers and Council
Amendments to By-Laws

E. F. Snyder, Jr., *Chairman*
Ventilation Requirements for Cigarette Smoke, by C. P. Yaglou
A Rapid General Purpose Centrifuge Sedimentation Method for Measurement of Size Distribution of Small Particles, by K. T. Whitby
Evaluation of Panel-Type Air Cleaners by Means of Atmospheric Dust, by H. A. Endres, W. T. Van Orman and R. P. Carter, Jr.

12:15 p.m. WELCOME LUNCHEON (*Ballroom*)
Speaker: Hon. Joseph S. Clark, Jr., Mayor of Philadelphia
2:00 p.m. Ladies Bus Trip: Historic Philadelphia or Art Museum
2:00 p.m. EXPOSITION — Opening of 12th International Heating and Air Conditioning Exposition at the Commercial Museum
Exhibit will close daily at 10:00 p.m. Monday through Thursday, and will close Friday at 6:00 p.m.
The ASHAE Booth is No. 68
2:00 p.m. TAC on Air Cleaning (*Room 104*)
2:00 p.m. TAC on Air Distribution (*Room 105*)
2:00 p.m. TAC on Odors (*Room 106*)
2:00 p.m. TAC on Sorption (*Room 107*)
4:00 p.m. Chapters Conference Committee Meeting (*Junior Room*)
6:00 p.m. DELAWARE VALLEY, U. S. A. FROLIC: Buffet Supper, Show, Dancing (The Benjamin Franklin — *Ballroom*)

TUESDAY — JANUARY 25

9:00 a.m. REGISTRATION (*Burgundy Room*)
9:30 a.m. SECOND TECHNICAL SESSION (*Ballroom*)
Call to Order by Vice Pres. John E. Haines
Report of Committee on Research—R. S. Dill, *Chairman*

R. S. Dill, *Chairman*
Preliminary Studies of Heat Removal by a Cooled Ceiling Panel, by L. F. Schutrum, John Vouris and T. C. Min
Measurement of Angular Emissivity, by Aydin Umur, G. V. Parmelee and L. F. Schutrum
Circuit Analysis Applied to Load Estimating, Phase II, by H. B. Nottage and G. V. Parmelee
Report of Tellers of Election

11:00 a.m. Ladies Luncheon and Bus Trip to Longwood Gardens
12:00 noon EXPOSITION — 12th International Heating and Air Conditioning Exposition — Commercial Museum
2:00 p.m. Committee on Research (*Red Room*)
2:00 p.m. Chapters Conference Committee Meeting (*Junior Room*)
7:00 p.m. Past Presidents' Dinner (*Union League Club*)
7:30 p.m. TAC on Cooling Load (*Room 104*)
7:30 p.m. TAC on Sound and Vibration Control (*Room 106*)

WEDNESDAY — JANUARY 26

9:00 a.m. REGISTRATION (*Lobby Floor — Burgundy Room*)

9:30 a.m. THIRD TECHNICAL SESSION (*Ballroom*)
- Call to Order by Second Vice Pres. John W. James

- Prof. E. R. Queer, *Chairman*
- Gas is an Important Factor in the Thermal Conductivity of Most Insulating Materials, Part II, by R. M. Lander
- Selection of Outside Design Temperature for Heat Load Estimation, by M. L. Ghai and R. Sundaram
- Study of Liquid-to-Liquid Heat Transfer in Hot Water Heaters, by F. W. Hutchinson, L. J. La Tart and N. W. Smith
- Solar Radiation during Cloudless Days, by J. L. Threlkeld and R. C. Jordan

12:00 noon EXPOSITION — 12th International Heating and Air Conditioning Exposition — Commercial Museum

12:30 p.m. Ladies Luncheon and Fashion Show (*Warwick Hotel — Ballroom*)

2:00 p.m. Nominating Committee (*Room 104*)

2:00 p.m. TAC on Evaporative Cooling (*Room 105*)

2:00 p.m. TAC on Heat Flow Through Glass (*Room 106*)

2:00 p.m. TAC on Heat Pump (*Room 107*)

2:00 p.m. TAC on Weather Data (*Room 108*)

7:00 p.m. BANQUET (*Ballroom*)
- Toastmaster: A. J. Nesbitt
- Presentation of F. Paul Anderson Medal to C. S. Leopold, by L. N. Hunter
- Installation of Officers
- Presentation of Past President's Emblem to L. N. Hunter, by M. F. Blankin
- Speaker: Dr. Milton Eisenhower, President of Pennsylvania State University

THURSDAY — JANUARY 27

9:00 a.m. REGISTRATION (*Lobby Floor — Burgundy Room*)

9:30 a.m. FOURTH TECHNICAL SESSION (*Ballroom*)
- Call to Order by Pres. L. N. Hunter

- Prof. Linn Helander, *Chairman*
- Paths of Horizontally Projected Heated and Chilled Air Jets, by Alfred Koestel
- Air Conditioning of Multi-Room Buildings, by R. W. Waterfill
- Effects of Weather Conditions on Cooling Unit Operation in a Residence, by H. T. Gilkey and S. Konzo
- Report of Committee on Resolutions
- Unfinished Business
- New Business
- Adjournment

10:00 a.m. Ladies Bus Trip to Atlantic City: Luncheon (*Haddon Hall — Wedgewood Room*), Boardwalk Sightseeing

12:00 noon EXPOSITION — 12th International Heating and Air Conditioning Exposition — Commercial Museum

1:00 p.m. Organization Meeting of 1955 Council (*Pink Room*)

FRIDAY — JANUARY 28

12:00 noon EXPOSITION — 12th International Heating and Air Conditioning Exposition — Commercial Museum (Closes at 6:00 p.m.)

Committee on Arrangements for ASHAE Meeting

John McElgin
General Chairman

Merrill F. Blankin
Honorary Chairman

John Everetts, Jr.,
Vice Chairman

Banquet — H. B. Prewitt, Chairman; E. I. Curley, H. R. James, F. R. Kelble, C. W. Procter, Jr., R. J. Sigel, R. H. Smiles, J. W. Sutch, G. E. Tuckerman, D. A. Wicks, E. I. Wildman.

Entertainment — E. K. Wagner, Chairman; R. H. Ackermann, F. H. Buzzard, P. A. Cavanagh, H. H. Erickson, H. J. Faltenbacher, J. H. Hucker, E. C. Lambert, C. J. Lubking, R. S. Mizener, F. F. Pfeiffer, Edward Semel, C. D. Shields, B. S. Urmstrom, K. W. Will.

Exposition — C. F. Dietz, Chairman; J. B. Banks, Warren Brewer, H. W. Doerrfuss, A. G. Dome, R. M. Gillett, J. P. Hartman, C. J. Kern, H. K. King, A. E. Kriebel, H. T. Makin, Jr., H. H. Mohrfeld, A. G. Mutimer, C. A. Rhea, R. M. Sharp, W. J. Sliney, G. F. Smith, W. D. Strause, H. N. Teuber.

Finance — P. H. Yeomans, Chairman; A. C. Caldwell, C. J. Forve, J. E. Hutchison, Leo Sudhaus.

Ladies — E. H. Dafter, Chairman; Mrs. M. F. Blankin, Co-Chairman; G. F. Bertrand, Isadore Director, E. L. Sederholm, Jr., M. J. Wind. Assisted by: Mmes. R. S. Arnold, G. F. Bertrand, F. H. Buzzard, L. M. Church, E. H. Dafter, C. F. Dietz, John Everetts, Jr., H. B. Hedges, G. E. Klapper, C. S. Leopold, Ludwig Mack, J. W. McElgin, H. B. Prewitt, A. M. Robertson, W. S. Scott, E. K. Wagner, P. H. Yeomans.

Publicity — Ludwig Mack, Chairman; G. P. Alexander, T. J. Atkins, Alan Dombro, Morris Sheffler, W. S. Scott.

Reception — J. O. Kirkbride, Chairman; R. S. Arnold, R. J. Augusterfer, Lucien Buck, E. G. Carrier, W. P. Culbert, C. B. Eastman, Edwin Elliott, H. B. Hedges, J. H. Hucker, R. F. Hunger, H. N. Jacobs, M. G. Kershaw, A. H. Koch, C. S. Leopold, N. S. MacFarlan, W. W. Malloy, H. M. Parent, Karl Rugart, R. P. Schoenijahn, Pierce Timmis.

Sessions — A. M. Robertson, Chairman; R. W. Cromie, J. J. Hucker, M. A. Sheffler.

Transportation — G. W. Powell, Jr., Chairman; R. L. Bitzer, J. M. Johnston, H. H. Mather, R. A. Metz, B. P. Morabito, H. V. Mount, Jr., M. J. Murray, G. W. Powell, R. V. Smith, R. B. Twining.

EXPOSITION EXHIBITORS AND THEIR EXHIBITS

HERE ARE THE names of the exhibitors who are scheduled for the 12th Air Conditioning Exposition — the International Heating & Ventilating Exposition, per latest advice at press time from the exposition management. Those listed with information on the products they will exhibit and the names of representatives who will be in attendance furnished these details direct to the publisher. With the booth numbers and the accompanying diagram of the exhibit hall, which are published here, each exhibitor is easily located.

The exposition is under the management of the International Exposition Co., E. K. Stevens, manager.

ACEC ELECTRIC CORP., 40 E. 49th St., New York 17, N. Y.—Booth 426

In attendance: C. C. Persily, H. R. Feder, E. Allen, J. Baron, G. Sperl, G. Rahenkamp, E. Falleur, T. McVeigh, J. Dricot, D. Wandycz.

Exhibiting: Electric motors of the following types — single phase fractional, three phase fractional, totally enclosed fan cooled, open drip proof, type "C" face mounted, and explosionproof. Cut-aways of several motors and large photos will illustrate the operation and quality of components and materials in these motors.

ACME INDUSTRIES, INC., 600 N. Mechanic St., Jackson, Mich.—Booth 501

In attendance: K. A. Weatherwax, P. A. Weatherwax, E. D. Dunphy, C. W. Millsom, D. G. Merrill, W. H. Peters, J. J. Bell, H. W. Smith, W. C. Rehor, P. Butterfield, M. A. Sheffler, Hal Margulis, K. D. Cunningham, J. T. Maloney, R. C. Deeg.

Exhibiting: "Flow-cold" packaged chiller, "Flow-temp" heat pump, cooling towers, evaporative condenser, "Flow-therm" packaged chiller, "Dry-Ex" water chiller, condensers, heat exchangers. Evaporative condensers and cooling towers, water-to-water heat pump, and flexible packaged chiller will be featured.

ACME MFG. CO., 7500 State Rd., Philadelphia 36, Pa.—Booth S-18

In attendance: Eugene Feiner, Thos. A. McGinley, D. H. Ruff.

Exhibiting: Pre-fab forced air fittings in aluminum and galvanized sheet metal, pipe and ells. Seven piece elbow packaging will be featured.

ACRO MFG. CO.—see CRISE CONTROLS DIV.

ADDISON PRODUCTS CO., Addison, Mich.—Booth C-62

In attendance: V. C. Knight, S. E. Vickers, M. A. Shantz, R. T. Smith, G. I. Boone, R. B. Grisbrook, Leo Freitas, J. A. Knight, K. F. Rumohr.

Exhibiting: Water cooled and air cooled residential packaged air conditioning systems in sizes 1½ hp through 5 hp.

ADELTA MFG. CO., INC., 21st and Ellsworth Sts., Philadelphia 46, Pa.—Booth 634

In attendance: Martin Corbman, Robert Corbman, Angelo Fasulo, Martin Posner, Morris Portnoy, Sid Schwartz, Bill Webster, Ray Westlund.

Exhibiting: Standardized pipe, duct and fittings, featuring "Nu-Lock" pipe and "Snap-Lock" trunk.

AFFILIATED GAS EQUIPMENT, INC.—see BRYANT HEATER DIV.

AIR CONDITIONING & REFRIGERATION NEWS, 450 W. Fort St., Detroit, Mich.—Booth 5

Exhibiting: Publication

AIR CONTROL PRODUCTS, INC., Coopersville, Mich.—Booth 25

In attendance: R. C. Hackenbruch, D. E. Stoll, W. A. Clark, P. G. Montgomery, G. G. Leonard, E. G. Biela, C. E. Denton, George Arehart.

Exhibiting: Perimeter diffusers — floor, baseboard, wall; visionproof grilles; return air grilles; adjustable ceiling ventilators; stackhead dampers; ceiling diffusers; air conditioning registers and grilles; installation frames; return air intakes; gravity registers; floor registers and return air faces; ventilators. A new perimeter baseboard diffuser will be featured.

AIR CONTROLS, INC., Div. of THE CLEVELAND HEATER CO., 2310 Superior Ave., Cleveland 14, Ohio—Booth 617

In attendance: B. G. Krause, S. S. Minnich, A. E. Friedman.

Exhibiting: Propeller fans, window fans, attic fans, blower-filter units, air conditioning blowers. A direct drive blower will be featured.

AIR DEVICES, INC., 185 Madison Ave., New York 16, N. Y.—Booth 533

In attendance: C. M. O'Day, G. J. Sweeney, P. O. Daves, T. A. Hughes, J. F. Scanlan.

Exhibiting: "Agitair" air diffusers, filters, exhausters.

AIRFAN ENGINEERING CO., 7401 Telegraph Rd., Los Angeles 22, Calif.—Booth C-25

AIR-MAZE CORP., 25000 Miles Rd., Cleveland 28, Ohio—Booth 109

In attendance: W. B. Watterson, F. P. Purvis, N. L. Lamprecht, B. T. Church, H. D. Cupitt.

Exhibiting: "Electromaze" electronic air cleaner, "Automaze Pulse-Action" automatic air filter, and air filter panels. New automatic cleaning and recharging accessory will be featured.

AIR-PATH PRODUCTS CO., 4620 Doll Ave., Baltimore 15, Md.—Booth S-81

In attendance: Robert A. Lucas, Carl L. Trier, William P. Flanigan, Allen P. Alt, Sr., George W. Mitchell, Bruce R. Kane, George Wahl, Raymond F. Weisman, F. C. Clifford, J. R. Dowdell, Walter Murphy, Joseph Merrill, Douglas Palmer, O. V. Overcash.

Exhibiting: Air intake louvers, back-draft dampers, motor operated dampers, door grilles, opposed blade dampers, fire dampers, multiple blade dampers, counterbalanced dampers, fan dampers, weatherproof louver dampers, counterbalanced relief dampers.

AIR & REFRIGERATION CORP., 439 Madison Ave., New York 22, N.Y.—Booth 69

In attendance: Walter L. Fleisher, Daniel C. Lindsay, Harvey S. Dutcher, Joseph H. Burges, Robert W. Gaines, Harry C. Jones, Richard W. Burges, Joseph L. Blackshaw.

Exhibiting: Articulated air conditioning which features "coordinated design of unlimited capacity" for industrial applications, with housing of factory insulated panels for indoor or outside installation. Plenum ahead of dehumidifier utilizes "A & R" louver dampers for controlled mixing of air quantities.

AIRTEMP DIV., CHRYSLER CORP., P.O. Box 1037, Dayton 1, Ohio—Booths 636 to 646

AIRTHERM MFG. CO., 700 S. Spring Ave., St. Louis 10, Mo.—Booth 713

In attendance: F. P. Kohlbry, M. Cobb, R. O. Reeves, J. C. Watkins, Jos. Cuba, John J. Bertram, Jr.

Exhibiting: Convectors, unit heaters (steam or hot water), gas fired unit heaters, direct fired heaters (gas or oil), and blower fan unit heaters.

AJAX BOILER & HEATER CO., 1519 W. 132nd St., Gardena, Calif.—Booth S-34

In attendance: Gregory N. Laushkin.

Exhibiting: Gas and oil fired water heating boilers featuring metalized headers in conjunction with copper tubes, "thus making a boiler with a non-corrosive water surface," furnished on both oil and gas fired jobs. Information will be available on sizing boilers for swimming pools.

A-J MFG. CO.; 2119 Washington St., Kansas City 8, Mo.—Booth 413

In attendance: Arthur S. Hurt, Jr., Ernest S. Preuitt, Margaret E. Hurt.

Exhibiting: Registers and grilles. New air conditioning supply and return air registers and grilles and opposed blade volume control will be featured.

ALCO VALVE CO., 865 Kingsland Ave., St. Louis 5, Mo.—Booth 322

In attendance: John E. Dube, George J. Boepple, A. L. Baker, T. J. Phillips, John A. Schenk, R. Willner, Erwin Lodwig, Robert E. Spence, H. A. C. Smith, Jack L. Barley, Ralph Tillney, Lyle Houghton, Richard Baseler.

Exhibiting: Thermostatic expansion valves (½ ton to 200 tons), solenoid valves, suction pressure regulators, distributors. Operating demonstration showing full range of distribution of new refrigerant distributor with minimum and maximum load control with thermo expansion valve will be featured.

ALDRICH CO., Wyoming, Ill.—Booths 630-632

In attendance: P. M. Stephenson, A. C. Blaisdell, B. Mulder, G. C. Hench, L. R. Williams.

Exhibiting: "Heat-Pak" and "Gulfstream" low pressure steel boiler-burner units (oil fired and gas fired); high pressure conversion oil burners. New boiler-burner package units incorporating installation and service features in six sizes, 243,000 to 594,000 Btu per hr net rating, and new burner with firing range of 4.5 to 10 gph will be featured.

ALLEN-BRADLEY CO., 136 W. Greenfield Ave., Milwaukee 4, Wis.—Booths 338-340-342

In attendance: L. M. Perkins, H. G. Rosenkranz, G. F. Pain, C. O. Sargent, D. V. Listino, R. P. Seaton, C. M. Snyder, R. W. Sundeen.

Exhibiting: Electric motor control.

ALLIS-CHALMERS MFG. CO., P.O. Box 512, Milwaukee 1, Wis.—Booth C-19

In attendance: A. D. Brown, J. R. Allen, R. H. Black, N. L. Danforth, H. E. Dickinson, J. H. Hadley, H. H. Kessler, H. E. Lanphear, C. B. Rumble, Jr., W. H. Taylor, W. J. Weaver, R. N. Brown.

Exhibiting: Motors, "Texrope" v-belt drive equipment, pumps.

AMERICAN AIR FILTER CO., INC., 215 Central Ave., Louisville 8, Ky.—Booths C-116, C-118, C-122, C-126, C-130

In attendance: W. G. Frank, John Hellstrom, R. H. Nelson, John McConnell, Arthur Nutting, Howard Fitch, Harry Noles, Robert F. Walker, I. W. Clark, Charles S. Stock, C. C. Sowerby, John M. Kane, James May, Charles Wright, Arthur Miller, Frank Carroll, John J. Willis, Frank Boone, Wallace Bateman, Dale Barnstable, John Kline, William J. Killian, W. N. Murray, John Frazier, Stan Fain, Robert DeLay.

Exhibiting: "Roll-O-Matic," "Multi-Duty," "Electro-Matic," "Electro-Cell" with type H washer, "Electro-PL," "Amerglas" filters, "Electro-Klean," heating and ventilating units, centrifugal fans, propeller fans, unit heaters, unit ventilators. "Roll-O-Matic," "Electro-Klean," heating and ventilating units and unit heaters will be featured.

AMERICAN AIR FILTER CO., HERMAN NELSON DIV.—see NELSON DIV., HERMAN

AMERICAN ARTISAN, 6 N. Michigan Ave., Chicago 2, Ill.—Booth 12

In attendance: Charles E. Price, Wallace J. Osborn, Robert A. Jack, George C. Cutler, C. M. Burnam, Jr., Clyde M. Barnes, Robert J. Osborn, James E. Sacra, David V. Mahan, Thomas V. Johnson.

Exhibiting: American Artisan, technical books, market data.

AMERICAN BLOWER CORP., Detroit 32, Mich —Booths 22 and 24

In attendance: Philadelphia branch office sales personnel.

Exhibiting: "Ventura" propeller fans, "Gyrol" fluid drive, "Venturafin" unit heaters, and air conditioning equipment.

AMERICAN COILS CO., 360 Thomas St., Newark, N.J.—Booth 613

In attendance: Michael Parcaro, James Turner, Geo. Mathews, Pete Hatcher, Louis Meringolo, Bill Dinger, Larry Jackewicz.

Exhibiting: Air conditioners, 3 through 20 tons; heating coils, 3 through 20 tons; heat pumps, 2 through 20 tons, with newly designed condenser; water chillers, 3 through 20 tons, displayed publicly for the first time; forced draft convectors. Newly designed "A C I" air conditioners will be on display; special features include "curvature" fins on cooling coil for greater efficiency, staggered air flow, two-tone enameled finish, complete twin refrigeration circuits on 10 and 15 ton models, choice of semi-hermetic or open type compressor equipment.

AMERICAN DISTRICT STEAM CO., INC., Bryant St., N. Tonawanda, N. Y.—Booths 705-707

In attendance: A. Ackerman, E. Averett, M. Hannah, J. Shade, L. VanOrden, J. Webb, M. Wilson.

Exhibiting: Expansion joints, heat exchangers, strainers, separators, traps. Dramatization of new East and West Coast manufacturing facilities will be featured.

AMERICAN FURNACE CO., 1300 Hampton Ave., St. Louis 10, Mo.—Booth 77

In attendance: C. H. Franke, E. H. Spellmeyer, R. L. Archibald, R. A. Cromwell, Robt. Meigs, J. S. Schlank, H. R. Mitchell.

Exhibiting: Warm air heating, cooling, and combination heating and cooling.

AMERICAN GILSONITE CO., 134 W. Broadway, Salt Lake City 1, Utah—Booth 847

In attendance: L. C. Wooster, E. H. Owen, J. F. Williams, M. A. Hanna, H. L. Armentrout.

Exhibiting: "Gilsulate" three zone conduit system. There will also be a hot exhibit box showing the resistance to heat loss by thermometer and thermocouple readings of "Gilsulate" for insulating and protecting underground hot pipes.

AMERICAN HYDROVAC, DIV. OF PITZ FOUNDRY, INC., 290 Scholes St., Brooklyn 6, N.Y.—Booths 735-737

In attendance: Albert C. Hauser, John C. Pedersen, R. M. Pitz, Karl Latch, Thomas C. Ingle.

Exhibiting: New vacuum heating pump unit, jet type vacuum heating unit, condensate return units with cast iron receivers. Vacuum heating pumping unit with a newly designed all bronze rotary vacuum pump operating independently of condensate pumps, with a newly designed cast iron receiver and low inlet return, will be featured.

AMERICAN IRON AND STEEL INSTITUTE —see COMMITTEE ON STEEL PIPE RESEARCH

AMERICAN MACHINE AND METALS, INC. —see DeBOTHEZAT FANS DIV.

AMERICAN RADIATOR & STANDARD SANITARY CORP., P.O. Box 1226, Pittsburgh 30, Pa.—Booths 26, 28, 47, 49

In attendance: Robert J. Wiley, James E. Harris, G. Gadarian, R. T. Sturges, H. V. Voye, E. W. Lindstrom.

Exhibiting: "Empire" boiler, "Arcoliner" boiler, "Oakmont" boiler, multifin convector, "Arcoflame" oil burner, "Stanflame" gas burner, "Temtrim" industrial fin type radiation, domestic hot water heater, 2 hp chiller unit, "Sunrad" radiator, "Remotaire" heating and air conditioning unit, "Radiantrim" baseboard panel heating. An action display of cutting and installing "Heatrim" baseboard panel heating will be featured.

AMERICAN RADIATOR & STANDARD SANITARY CORP., SUNBEAM AIR CONDITIONER DIV.—see SUNBEAM AIR CONDITIONER DIV.

AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS, Headquarters—62 Worth St., New York 13, N. Y. Research Laboratory—7218 Euclid Ave., Cleveland, Ohio—Booth 68

In attendance: W. M. Vidulich, D. T. Donovan, D. J. Vild, A. V. Hutchinson, C. H. Flink, C. H. B. Hotchkiss, R. F. Duysters, E. R. Kaiser, C. M. Humphreys.

Exhibiting: Demonstrations of Research Laboratory work on air infiltration, identification of air contaminants and heat reflection will be featured. Background display will highlight research, publication, and membership activities of the society. Use of National Bureau of Standards' katharometer for measuring air infiltration, utilizing helium mixed with room air as a tracer gas to show dilution produced by infiltration will be shown. Centrifugal sedimentation apparatus, developed by University of Minnesota, which measures dust particles of 1/100,000 of an inch will also be featured.

AMMERMAN CO., C. L., 110 N. Second St., Minneapolis 1, Minn.—Booth S-49

In attendance: C. L. Ammerman, G. A. Ammerman, T. L. Ammerman, C. E. Sparrow

Exhibiting: "AirXpeler" and "AirMpeler" power roof exhausters, both direct drive and belt driven models, of modern, low silhouette design. The largest units move 47,000 cfm and are only 36 in. high.

ANDERSON CO., THE V. D., 1935 W. 96th St., Cleveland 2, Ohio—Booth 725

Exhibiting: "Super-Silvertop" steam traps, float type traps, and "Hi-eF" purifiers, and featuring "Heat-Kwik Silvertop" traps.

ANEMOSTAT CORP. OF AMERICA, 10 E. 39th St., New York 16, N. Y.—Booths 406-408

In attendance: A. R. Gilbert, F. Honerkamp, R. F. Hayes, F. J. Kurth, W. F. Peters, A. Rust-Oppenheim, V. F. Self, G. R. Wallen.

Exhibiting: Air diffusers, high velocity units, and "Anemotherm". Display of operating high velocity units and air diffusers for conventional systems will be featured.

A-P CONTROLS CORP., 2540 N. 32nd St., Milwaukee 45, Wis.—Booth 744

In attendance: R. W. Johnson, Dil Moerick, Tom Melville, Arno Schubert, Bob Sloane, Larry Thompson, Jack Cowan, Brad Carroll, Dick Morton, Al Neva, R. Ludwig, Walter Ellinghoe.

Exhibiting: Oil controls, gas controls, refrigeration controls and valves made by new subsidiary, Milwaukee Valve Co. New "Gasapack" control for space heaters will be featured.

ARMSTRONG FURNACE CO., 851 W. Third Ave., Columbus 8, Ohio—Booths 1 & 3

In attendance: D. H. Kinnan, W. J. Olsen, L. G. Hickok, C. L. Brooks, J. R. Swinehart, T. J. Hughes, C. L. Bryson, P. L. Kutscher.

Exhibiting: Gas fired horizontal furnace; "Companion Unit" water cooled summer air conditioner (displayed in conjunction with winter air conditioning furnace); and air cooled summer air conditioning equipment.

ARMSTRONG MACHINE WORKS, 816 Maple St., Three Rivers, Mich.—Booths 626-628

In attendance: O. E. Ulrich, Jr., C. R. Daugherty, A. E. Armstrong.

Exhibiting: Glass model of steam trap operating on 7 lb steam pressure; strainers; and featuring hot water heating controls.

ARROW-HART & HEGEMAN ELECTRIC CO., 103 Hawthorn St., Hartford 6, Conn.—Booth S-72

ATLANTIC PIPEBENDING & FABRICATING CORP., P.O. Box 157, Wood-Ridge, N. J.—Booth 308

AUER REGISTER CO., THE, 6600 Clement Ave., Cleveland 5, Ohio—Booth C-59

In attendance: George R. Metzger, Herbert F. Curtis, Allen H. Bechtel, Floyd A. Hancock.

Exhibiting: Registers and grilles for the heating and air conditioning industry, with emphasis on "Perfusaire" for perimeter heating and cooling, and introducing opposed blade dampers for the "Streamliner" line.

AURORA PUMP DIV., THE NEW YORK AIR BRAKE CO., 619 Loucks St., Aurora, Ill.—Booths C-27, C-29

In attendance: G. W. Anderson, M. S. Maleson, L. Maleson, S. R. Gerhart, L. R. Parrish, Mario Corti, Carl Swenson.

Exhibiting: Centrifugal and turbine type pumps.

AU-TEMP-CO CORP., 657 Broadway, New York 12, N. Y.—Booth C-34

In attendance: Edward J. Zeitlin, Harry Zeitlin, Al Fowler, Lee Leighton.

Exhibiting: Electronic control and motorized valves.

AUTO-FLO CORP., 14590 Schaefer Highway, Detroit 27, Mich.—Booth 32

In attendance: Donald B. Sutherland, Milton Perlman, Joseph Perlman, Victor Vogel, Ray Westlund, P. J. Halter, Harold Burke, James Miner, Bernard Magiday, Hal Michelman, Irving Suss, Arthur Freidman, R. H. Sweeney.

Exhibiting: Humidifiers, fuel oil filter, fuel oil cartridge.

AUTOMATIC DEVICES CO., INC., 714 Hillgrove Ave., Western Springs, Ill.—Booth 314

In attendance: H. T. Kucera, O. W. Dobson, Walter MacPherson, Martin Heffler.

Exhibiting: "Weather-Man", "Weather-Flo" and 3-way "Weather-Flo." New regulator for controlling heat flow to all classes of multiple occupancy buildings, regardless of kind or type of heating system, will be featured. Unit is designed to allow the installation of the control mechanism indoors with only the temperature responsive bulb being installed outdoors.

AUTOMATIC FIRING CORP., THE, 4417 Oleatha Ave., St. Louis 16, Mo.—Booths 905-907

In attendance: James J. Lee, F. J. Hollerbach, Gene Gunkel, Ed Bixler, Robert Neuenhahn.

Exhibiting: "Cool-A-Matic" air conditioning units.

AVCO MFG. CO., LYCOMING DIV.—see SPENCER HEATER

BACHARACH INDUSTRIAL INSTRUMENT CO., 7301 Penn Ave., Pittsburgh 8, Pa.—Booth 415

In attendance: George Gardner, Charles Kroshel, Rudolph Ulrich, J. A. Stein, Jerry Snoblen, J. W. Smith.

Exhibiting: "Fyrite" combustion testing instruments, including CO_2 analyzer, stack thermometer, "Draftrite" draft gage and "True-Spot" smoke tester; "Tempscribe" temperature and operation recorders and "Florite" direct reading velocity meter. Filter gage which signals when to change filters on warm air heating systems and air conditioning units will be featured.

BALTIMORE AIRCOIL CO., INC., 2615-35 Mathews St., Baltimore 18, Md.—Booth C-17

In attendance: John Engalitcheff, Jr., R. R. Forseille, A. M. Norris, R. W. Pentecost, George Klein, L. R. Bookhulze, Mrs. M. K. Kok, Joseph T. Pope, William Brown.

Exhibiting: Water saving heat transfer equipment. New lines of equipment will be introduced.

BARBER-COLMAN CO., 1300 Rock St., Rockford, Ill.—Booth 602

In attendance: C. J. Braatz, E. A. Greenlee, C. P. Yates, J. E. Wright, J. R. Muraski, A. W. Schach, J. A. Dunn, W. G. Young, D. L. Dittloff, H. P. Deacon, M. Dahlgren, J. P. Sullivan, W. W. Kennedy.

Exhibiting: Electric and electronic controls and air distribution products for heating, ventilating and air conditioning.

BARBER-COLMAN CO., WHEELCO INSTRUMENTS DIV., 1300 Rock St., Rockford, Ill. —Booth 337

In attendance: R. A. Schoenfeld, H. Proske, C. G. Holbrook, P. F. Stevens, J. A. Wright, J. E. Sauerman, F. E. Thiel, R. W. Channell, S. Kuta, J. W. Hancock, W. E. Karslo, K. Day, S. Pachyn, H. Shugars.

Exhibiting: New "Flame-otrol" electronic combustion safeguard systems for oil and gas fired furnaces, ovens, boilers, kilns and dryers will be featured, as will remote indicating thermometers for multi-station indications of space and system temperatures.

BARKOW MFG. CO., INC., AUG. G., 2230 S. 43rd St., Milwaukee 15, Wisc.—Booth C-37

BARNES & JONES, INC., 128 Brookside Ave., Jamaica Plain, Boston, Mass.—Booth 63

BARRY BLOWER CO., 3100 California St., N. E., Minneapolis 18, Minn.—Booth S-49

In attendance: Benjamin H. Barry, Herman Freidson.

Exhibiting: Blower wheels, blower housings.

BELL & GOSSETT CO., 8200 N. Austin Ave., Morton Grove, Ill.—Booths 828-832

In attendance: E. J. Gossett R. E. Moore, C. E. Pullum, W. A. Boone, A. Meeg, Frank Gall, H. R. Henke, R. A. Patterson and direct factory and district representatives from the entire United States.

Exhibiting: "B&G Hydro-Flo" products for both heated and chilled water systems. Several brand new products will be exhibited.

BERGER FURNACE CORP., 4th & Main Sts., Belle Vernon, Pa.—Booths S-71, S-73

In attendance: A. H. Berger, H. W. Abrams and others.

Exhibiting: "Inversaire" counterflow winter air conditioner, gas fired furnace, oil fired furnace, and featuring combination heating and cooling unit (air cooled) as well as "Perima-Base" warm air radiant baseboard for heating and cooling.

BERTRAM CO., THE HARVEY P., 561 Reading Rd., Cincinnati 2, Ohio—Booth S-25

In attendance: Harvey P. Bertram, Arthur P. Butler.

Exhibiting: "Industrial Air" induced draft fan and "Pyrovent" roof ventilator will be featured.

BETT-MARR MFG. CO., 621 E. Excelsior Blvd., Hopkins, Minn.—Booth 441

In attendance: Richard L. Linquist, Joseph M. Dillon.

Exhibiting: 24 in. three wheel band saw, for cutting stacked sheet metal, CR, black iron, stainless steel, etc.

B-I-F INDUSTRIES, INC.—see BUILDERS-PROVIDENCE

BINKS MFG. CO., 3114-44 Carroll Ave., Chicago 12, Ill.—Booth 236

In attendance: C. R. Kranz, A. G. Stacy, L. A. Hamilton.

Exhibiting: Cooling towers. New 2 and 3 ton residence cooling tower will be featured.

BONAIR PRODUCTS, INC., 5010 Warrington Ave., Philadelphia 43, Pa.—Booths S-3 and S-5

In attendance: Frank A. McKee, Joseph L. McHale, Carl V. McCarty, Edwin J. Lynch, Steven Szibler, Jr., William L. McHale, John A. Callahan, Jr.

Exhibiting: Air and water cooled residential air conditioning equipment, gas and oil fired warm air furnaces. Year 'round air conditioning units for the project builder will be featured.

BORG-WARNER CORP., HYDRALINE PRODUCTS DIV.—see HYDRALINE PRODUCTS DIV.

BRANDES CO., 2046 Winnebago St., Madison 4, Wis.—Booth S-17

In attendance: E. E. Brandes, Fred Voth.

Exhibiting: Warm air baseboard and warm air baseboard diffusers. New baseboard lines will be shown for the first time.

BREIDERT CO., THE G. C., P.O. Box 1190, 13690 Vaughn St., San Fernando, Calif.—Booth S-107

In attendance: George M. Breidert, Roswell S. Jones, H. Edward Gross.

Exhibiting: Power roof ventilators, "Air-X-Hauster," vent flue caps and chimney tops, marine ventilators.

BROOKSIDE PRODUCTS CO., INC., McCordsville, Ind.—Booths S-52, S-54

In attendance: Claude A. Forth, Sr., Claude A. Forth, Jr., William Donahue.

Exhibiting: Blower wheels, fan blades, and ventilating units will be exhibited for the first time.

BROWN PRODUCTS CO., 97-12 Metropolitan Ave., Forest Hills 75, N. Y.—Booth 703

In attendance: A. Brown, H. W. Gray, J. Aronczyk, O. Mann.

Exhibiting: Baseboard radiation, fintube radiation, air cooled water chilling units, remote room air conditioning units, convectors, ceiling type air conditioning units. Air cooled water chilling units. remote room air conditioning units and ceiling type air conditioning units will be featured.

BRUNDAGE CO., THE, 500 N. Park St., Kalamazoo 11, Mich.—Booth 331

In attendance: H. F. Brundage, F. W. Brundage, W. A. Rockafield, L. C. Kroes, Fred E. Bottiger, Walter F. Briggs, Donald Johnston, George D. Kingsland, Bruce McLouth, E. N. Moncrief, B. H. Nunnally, Lou Reining, John Sibarium, N. W. Wattles, Ray Westlund, F. F. Symington, Jack Tracy.

Exhibiting: Complete line of air conditioning and heating blowers in belt drive and direct drive applications, universal blower to accomplish any discharge, blower filter package units and exhausters. New universal blower will be featured.

BRUNNER MFG. CO., 1821 Broad St., Utica 1, N. Y.—Booth 600

In attendance: A. G. Zumbrun, F. C. Hawk, J. W. Thomas, J. B. Fleming, F. E. Wilson, W. M. Cashin.

Exhibiting: 50 hp condensing units, 3 hp semi-hermetic motor-compressor.

BRYANT HEATER DIV., AFFILIATED GAS EQUIPMENT, INC., 17825 St. Clair Ave., Cleveland 10, Ohio—Booth C-114

BUFFALO FORGE CO., 490 Broadway, Buffalo 4, N. Y.—Booths 522-526

In attendance: C. C. Cheyney, W. R. Heath, R. D. Madison, J. E. Gill, C. W. Lockhart, F. B. Stubinger, B. W. Ellis, J. H. Gregory, L. C. Davidson, R. F. Hunger, R. D. Robson, R. T. Thornton, R. Farnham, W. H. Holt, R. P. Warren, J. W. Kipphut, P. E. Evans, R. Jorgenson, F. C. Johns.

Exhibiting: "Limit Load" fan, multi-zone blow thru cabinet, 54 in. heavy duty propeller fan, 32 in. vaneaxial fan, fixed vanes for fan inlet bell, variable inlet vanes for fan inlet bell, "Breezo" fans, and bronze-fitted pump. New horizontal multi-zone cabinet with square tubing structural frame and removable panels throughout for complete inspection and maintenance of internal parts will be featured. Vaneaxial "Spraybooth" fan, of particular interest to the paint and chemical application field, is of special design to permit periodic interior cleaning of accumulated foreign substances through large cleanout openings, and will also be featured.

BUILDERS-PROVIDENCE INC. (Division of B-I-F INDUSTRIES), 345 Harris Ave., Providence 1, R. I.—Booth C-43

In attendance: E. E. Litterick, F. W. Deutsch, S. R. Amylon.

Exhibiting: New "Dall" flow tube, dual ranging "Shuntflo" meters, "Propeloflo" meters, venturi insert nozzle, "Shuntflo" meter. The first two products will be featured.

BURGESS-MANNING CO., 5970 Northwest Highway, Chicago 31, Ill.—Booths 616-618

In attendance: D. W. Day, Allen Wilson, W. C. Kadow.

Exhibiting: "3-way" functional ceiling, providing radiant heating and radiant cooling with acoustic control and designed to eliminate thermal lag and over-ride.

BURNHAM CORP., Boiler Div., Main St., Irvington, N. Y.—Booth 401

In attendance: A. E. Bastedo, V. A. Good, H. J. Wines, F. R. Brophy, W. H. Samson, G. M. Corcoran, H. R. Way, W. C. Heagy, A. A. Ettore, R. F. Bogle, F. E. Adams.

Exhibiting: "Base-Ray" radiant baseboards, "Radiant" radiator, "Hide-Away" cooling unit, "Pace-Pak" factory assembled oil heating unit, gas boiler, "Pacemaker" oil boiler. Central cooling equipment for summer comfort teamed up with hot water baseboard radiant heating for winter comfort will be featured.

BUSH MFG. CO., THE, 179 South St., West Hartford 10, Conn.—Booth 250

In attendance: Cecil Boling, E. M. Flannery, J. A. Mulcahey, Joe Koren, C. T. Cavanaugh, J. K. Campbell, George J. Finck, George Moncher, George Luce, Joe Herrmann, Earle Bates, Hugo Basch, Milton Kalish, Leon Traney, George Davis, Perley Barker.

Exhibiting: Multi-zone units, new copper deck cooling tower, convectors, cooling coils, steam coils, baseboard radiation, finned pipe radiation, under-the-window unit. Package chiller, as manufactured by subsidiary, Heat-X, Inc., heat interchanger, inner fin shell and tube chillers and condensers will be featured.

BYERS CO., A. M., 1810 Clark Bldg., Liberty Ave., Pittsburgh 22, Pa.—Booth 240

In attendance: R. H. Clay, J. W. Cooper, H. K. King, V. C. Lawrence, J. H. Little, E. L. MacWhorter, J. Matthew, W. J. Mayer, J. J. Moore, R. J. Bricmont.

Exhibiting: Wrought iron pipe and plate and featuring wrought iron cold drawn tubing.

CAMBRIDGE FILTER CORP., 738 Erie Blvd. East, Syracuse 3, N. Y.—Booth S-67

In attendance: David H. Northrup, Paul M. Engle, William W. Baldwin.

Exhibiting: "Absolute" filter, and featuring "Aerosolve" filter designed for multi-filter banks in industrial and comfort ventilation and air conditioning supply systems, and for filtration of exhaust gases. A new smoke test demonstrator will also be shown.

CAREY MFG. CO., PHILIP, Cincinnati 15, Ohio—Booth S-121

In attendance: W. C. Bowman, R. C. Bressan, F. J. Donohue, C. L. Hoshaw, H. K. Marcy, G. H. Milner, F. M. Nearing, J. C. Rector, C. D. Spaid, L. C. Underwood, E. S. Walls, C. M. Weber, C. H. Zimmerman.

Exhibiting: Commercial exhaust fan; pipe coverings (asbestos, 85% magnesia); cements, insulating, adhesive; insulation, block and sheet; heater, bathroom; asbestos papers; duct, insulated and acoustical. New commercial exhaust fan and new "MW-One" insulating and finishing cement will be featured.

CARNES CORP., Verona, Wis.—Booth 521

In attendance: W. R. Carnes, F. A. Freese, Arnold Croohe, Robert Rankel, Len Carr, Don McAuley, Bob Gorrell, Raymond Kreger.

Exhibiting: Ceiling air diffusers and power roof ventilators. New style, low contour, mushroom type centrifugal and axial flow models of roof ventilators and newly designed round, square and rectangular ceiling diffusers will be featured.

CARRIER CORP., 300 S. Geddes St., Syracuse 1, N. Y.—Booths 204-206

In attendance: G. B. Gillam, H. Hoffman, L. Church, E. Dafter, H. Peacock, A. A. Giannini, M. J. Wilson, D. W. Hoppock, R. H. Smiles, W. A. Lake, W. C. Egan, W. G. Hillen, M. J. Kane, F. Dale Meeder, J. Voigt.

Exhibiting: Residential air conditioning equipment, multi-room building air conditioning equipment, commercial (stores and shops) air conditioning equipment, and automatic ice makers.

CARVER PUMP CO., 1056 Hershey Ave., Muscatine, Iowa—Booth 743

In attendance: James E. Kuppe, Robert E. Tanner.

Exhibiting: Centrifugal pumps, featuring fractional horsepower motor driven pump.

CENTURY ELECTRIC CO., 1806 Pine St., St. Louis 3, Mo.—Booth 900

In attendance: R. N. Hill, G. C. Henderson, Fred Powers, R. Biller, L. Downing, F. Hatfield, W. D. Helm, R. A. Jervis, R. Moseman, J. M. Hicks, J. Clark, W. Nace, A. Neher, P. Gerst, H. McInerney.

Exhibiting: Fractional and integral horsepower motors (new re-rated line), new three speed capacitor type motor for the fan and blower industry.

CENTURY ENGINEERING CORP., 401 Third St., S. E., Cedar Rapids, Iowa—Booth 502

In attendance: B. J. Lattner, W. S. Moellering, J. O. Rosche, Charles Walker, A. E. Carr, E. A. Jones, Henry Gabel, G. L. Graham, M. M. MacKinnon, John S. Davis, R. F. Considine, E. J. Mettelka, Andrew Goidich, E. W. Johnson.

Exhibiting: Oil and gas furnaces (basement model, highboys, horizontal units); oil burners; gas conversion burner. New 1955 model oil burner will be featured.

CHACE CO., W. M., 1600 Beard Ave., Detroit 9, Mich.—Booth 316

CHAMPION BLOWER & FORGE CO., Charlotte St. & Harrisburg Ave., Lancaster, Pa.—Booth 643

In attendance: John A. Joyce, Henry K. Long, Harvey C. Gibney, John M. Kadlecik, Elmer F. Hirsch.

Exhibiting: Centrifugal fans and blowers (both steel and cast iron housings), attic fans, acid and rust-resistant fans. A new line of acid-resistant blowers will be featured.

CHAR-GALE MFG. CO., Route 2, Anoka, Minn.—Booth 726

In attendance: C. L. Johnston, L. C. Johnston, Nick J. Dovolis, Harley Sipprell, Joe LaTuff, George Standen.

Exhibiting: Ducts and fittings, elbows, rain goods, registers, grilles, floor diffusers, ceiling diffusers, baseboard diffusers, wall diffusers.

CHELSEA FAN & BLOWER CORP., 639 South Ave., Plainfield, N. J.—Booth 244

In attendance: E. W. Lohman, W. J. Lohman, Jr., C. J. Yamas, R. J. Hutchison, Jr.

Exhibiting: Window fans and industrial fans.

CHICAGO BLOWER CORP., 9867 Pacific Ave., Franklin Park, Ill.—Booth 48

In attendance: F. H. Gohl, E. R. Anderson, L. E. Flanders, Jr., D. M. Campbell, N. W. Cargill, F. G. Gerrish, E. Glenn Breeden, T. Houlihan.

Exhibiting: New centrifugal airfoil fan; new axial airfoil fan; "M.D." utility fan; turbo pressure blower; "Spid" steel plate induced draft fan (a new packaged centrifugal induced draft fan for boilers from 30 hp to 350 hp and 4500 EDR to 50,000 EDR); roof ventilator; experimental fan.

CHICAGO PUMP CO., 622 Diversey Pkwy., Chicago 14, Illinois—Booths 201 and 205

In attendance: G. D. Bers, M. Spiegel, L. Nechine, H. E. Martin, E. J. Lasworth, S. S. Whitby, P. S. Whitby, C. Lawrenz.

Exhibiting: Centrifugal pumps for booster service, hot and chilled water circulating; condensation pumps, "Flush Kleen" sewage ejector. Improved and expanded line of circulating pumps for hot and chilled water will be featured.

CHRYSLER CORP.—see AIRTEMP DIV.

CIRCLE AIR INDUSTRIES, INC., 244 Herkimer St., Brooklyn 16, N. Y.—Booth S-23

In attendance: Albert A. Paley, Murray Neckman, John P. McGinley, George McGrath, John J. Reilly, Charles Lowery.

Exhibiting: Standard electric convection heaters, baseboard electric convection heaters, standard dual air conditioners, baseboard dual air conditioners, cold generators. All products will feature built-in thermostats and in addition all dual air conditioners will feature a ten-point air volume control.

CLARAGE FAN CO., 619 Porter St., Kalamazoo 16, Mich.—Booth C-170

In attendance: R. A. Wasson, S. H. Downs, C. R. McConner, C. O. Fury, N. A. Melzer.

Exhibiting: Sprayed coil central station type dehumidifier, "Multitherm" unit, ventilation unit, ventilation fan with backward curve blades, furnace fan. A revised design of the sprayed coil unit for central system installation will be shown for the first time.

CLAYTON & LAMBERT MFG. CO., LAMNECK DIV., 1025 Lamneck St., Middletown, Ohio—Booth C-64

In attendance: R. F. Burger, Frank Gavaletz, Claude Forbes, Mahlon Driever, Roger Sherwood, W. B. Tyrrell.

Exhibiting: Air distribution pipe and fittings for heating and cooling; water heaters. Several new special fittings will be featured.

CLEAVER-BROOKS CO. (Boiler Div.), 326 E. Keefe Ave., Milwaukee 12, Wis.—Booth 147

In attendance: J. C. Cleaver, F. W. Hainer, F. A. Loebel, H. A. Holtz, O. E. Jacobsen, F. A. Phillips, J. W. Stevens, A. E. Miller, V. N. Harwood, W. C. Blake, F. A. Hopp, F. I. Rounds, A. A. Wood, H. R. White, P. A. Wright, R. B. Hickman.

Exhibiting: Self-contained boilers for heating. New line of such boilers will be featured.

CLEAVER-BROOKS CO. (Burner Div.), 326 E. Keefe Ave., Milwaukee 12, Wis.—Booth 932

In attendance: J. V. Resek, H. McCoy, W. DeMuth, M. Will.

Exhibiting: "Hev-E-Oil" burner line. New burners will be featured.

CLEVELAND HEATER CO.—see AIR CONTROLS, INC., DIV.

COBELL INDUSTRIES, INC., P.O. Box 1157, Fort Worth, Texas—Booth S-96

COLE HOT BLAST MFG. CO., 3817 S. Racine Ave., Chicago 9, Ill.—Booth S-76

In attendance: George H. Derbyshire, L. F. Mack, A. F. Wedderspoon.

Exhibiting: Gas fired domestic incinerators.

COLEMAN CO., INC., THE, 250 N. St. Francis Ave., Wichita 1, Kans.—Booths 539-543-547

In attendance: Sheldon Coleman, Leland C. Ginn, Jack Kice, C. R. Douthitt, V. D. Call, H. M. Morton, L. L. White, L. T. Ash, W. McCollum.

Exhibiting: Summer air conditioners (self-contained and remote); gas and oil fired forced air furnaces (vertical, console and horizontal types); gas wall and floor furnaces; gas and oil fired space heaters; gas water heaters. Vertical and console furnaces, both gas and oil; summer air conditioning units; and several models of oil and gas fired space heaters will be featured.

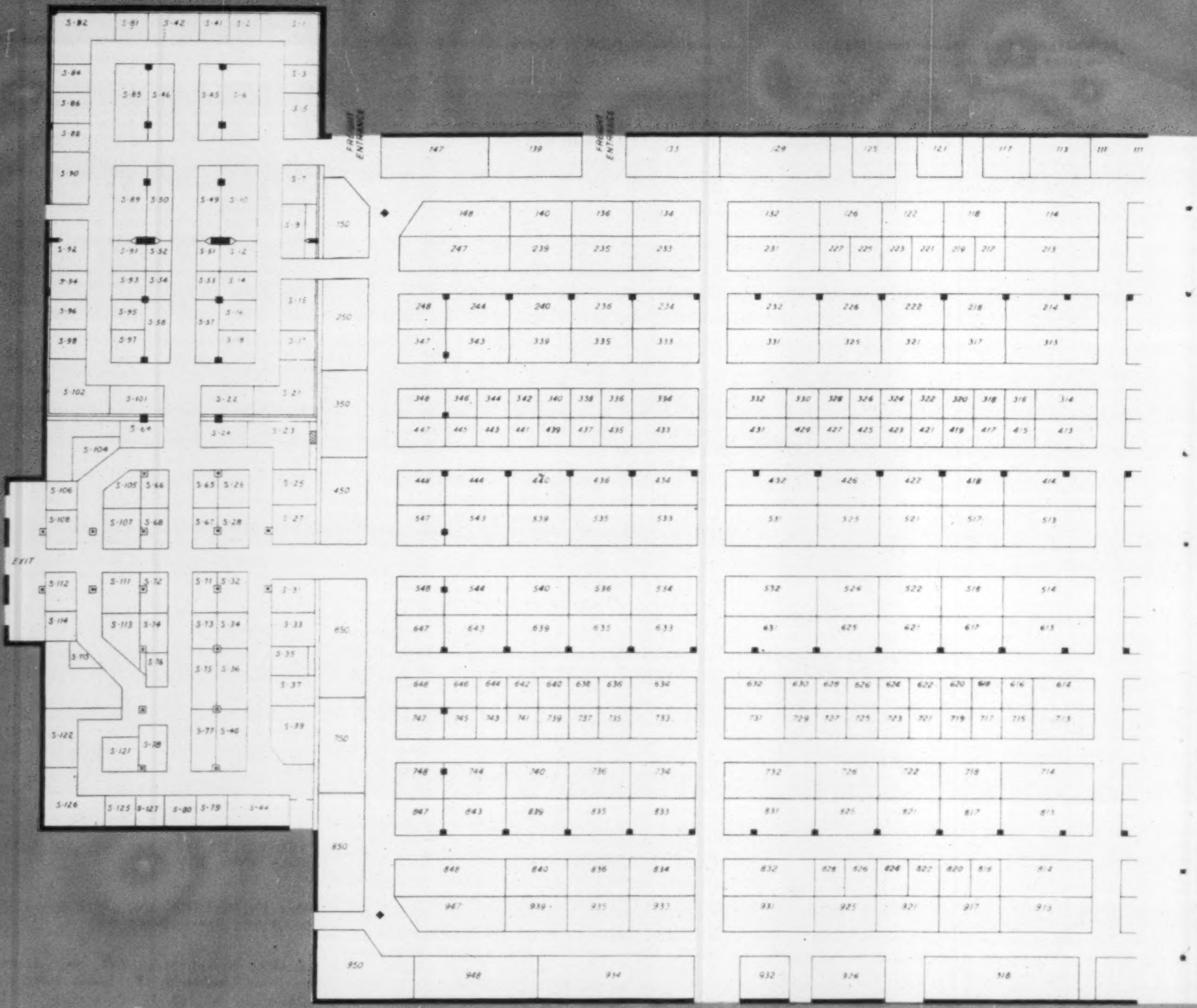
COLUMBIA BURNER CO., THE, 729 Ewing St., Toledo 7, Ohio—Booth C-35

In attendance: Arnold A. Muenzer, J. F. Capoun, C. C. Connelly.

Exhibiting: Gas conversion burners—multiple port, single port and inshot models. Inshot burner for converting oil to gas, and forced air gas furnaces, will be featured.

COMBUSTION CONTROL DIV., ELECTRONICS CORP. OF AMERICA, 718 Beacon St., Boston 15, Mass—Booth 55

In attendance: L. D. Sibley, B. E. Shaw, P.



Layout of the Exposition

K Ryder, W. S. Tallon, E. F. Hall, L. F. Smith

Exhibiting: "Fireye" systems for automatic gas, oil, and combination fuel burners; for gas, oil, pulverized coal, process or combination fuel burners; for manually and semi-automatically ignited gas, oil, pulverized coal, or combination fuel burners; for commercial light oil, gas, and combination light oil/gas burners; smoke density indicators and recorders; packaged flame failure safeguard controls systems for automatic burners and for multi-burner power boilers; burner operating controls, limit switches, safety shutoff valves, and control accessories. New and improved smoke detection indicator system and packaged control systems for all burners will be shown for the first time.

COMBUSTIONEER DIV., THE STEEL PRODUCTS ENGINEERING CO., 1205 W. Columbia St., **Springfield, Ohio—Booth 133**

In attendance: H. W. Shirey, H. E. McCampbell, H. McCool, D. E. Linkenhoker, O. J. Puckett.

Exhibiting: Low pressure and high pressure oil burners, gas conversion burners, stokers, humidifiers. New gas conversion burner, humidifier and modulating gear case will be featured.

COMMERCIAL FILTERS CORP., 2 Main St., **Melrose 76, Mass.—Booth 431**

In attendance: J. R. Chisholm, R. L. Fielding, H. C. Corwin, H. A. Wilson, R. Schadler, W. J. Rossi.

Exhibiting: "Fulflo" oil burner filters and replacement honeycomb filter tubes for various capacities; fuel oil filters for bulk plants and delivery trucks; and filters for boiler feedwater.

COMMERCIAL REFRIGERATION AND AIR CONDITIONING, 1240 Ontario St., **Cleveland 13, Ohio—Booth S-12**

Exhibiting: Publication.

COMMITTEE ON STEEL PIPE RESEARCH, AMERICAN IRON AND STEEL INSTITUTE, 350 Fifth Ave., New York 1, N. Y. —Booth 309

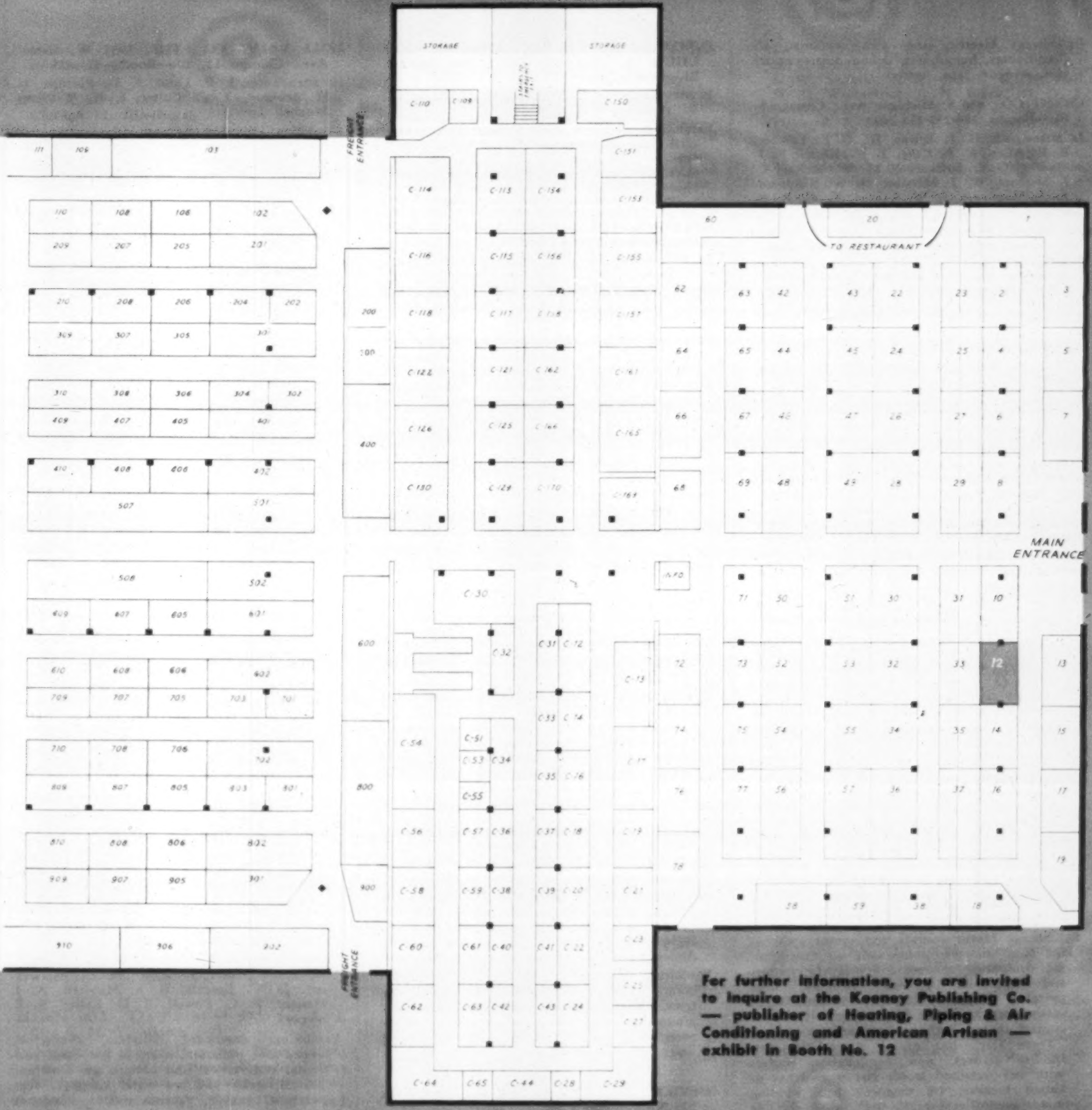
In attendance: George D. Lain.

Exhibiting: Use of steel pipe in radiant heating and snow melting installations.

CONDENSATION ENGINEERING CORP., 3511 W. Potomac Ave., Chicago 51, Ill.— Booth 226

In attendance: B. A. Johnson, Wayne Limbert, Walt Aschliman, Tom Jones, Bob Wasson.

Exhibiting: "Vitroliner" prefabricated chimneys and chimney lining pipe.



For further information, you are invited to inquire at the Keeney Publishing Co. — publisher of Heating, Piping & Air Conditioning and American Artisan — exhibit in Booth No. 12

CONGRESS DRIVES DIV., TANN CORP., 3750 E. Outer Dr., Detroit 34, Mich.—Booth 647

In attendance: Herman Tann, Stuart Chosid, A. C. Dueweke, James Walsh, John Fitzpatrick, E. A. Caskey, William Smart.

Exhibiting: Pulleys, V-belts, couplings, pillow blocks, bearings. "Permawick" pillow block bearing will be a feature.

CONNOR ENGINEERING CORP., Danbury, Conn.—Booth 813

In attendance: Henry A. Baker, Peter A. Argentieri, A. L. Register, Charles Coward, Carl B. Eastman.

Exhibiting: "Dorex" activated carbon air recovery systems, "Kno-draft" air diffusers. Late developments in air and gas purification and in conventional and high pressure air diffusion, including new dual duct automatic air mixing apparatus, will be featured.

CONTINENTAL AIR FILTERS, INC., 2520 Helm St. (P.O. Box 1647), Louisville, Ky. —Booth 926

In attendance: Wm. K. Gregory, Frank B. Johnston, Jr., Sidney S. Emison, Ray L. Craig, John A. Taylor, Jr., L. P. Bryant, Robert Hoover.

Exhibiting: Automatic self-cleaning air filters; cleanable, viscous impingement air filters; and featuring "Dycon" dry type air filters.

CONTRACTOR, THE, Grand Central Terminal Bldg., New York 17, N. Y.—Booth S-106

Exhibiting: Publication.

COPELAND REFRIGERATION CORP., Sidney, Ohio—Booth C-129

In attendance: F. V. Gleason, W. G. Von Meyer, Rudy Berg, J. E. Barker.

Exhibiting: Condensing units, compressors and motor-compressors. Suction-cooled 3 hp, 5 hp and 7½ hp "Copelametic" motor-compressors for air cooled condensing units will be featured.

CORBMAN BROS., 25th & York Sts., Philadelphia 32, Pa.—Booth 234

In attendance: Joseph Corbman, Martin W. Corbman, A. L. Corbman, Martin B. Corbman, Philip P. Remer.

Exhibiting: Prefabricated ducts and fittings for rectangular and small pipe perimeter installations; smoke pipe and elbows.

CORY CORP., 221 N. LaSalle St., Chicago 1, Ill.—Booth C-158

In attendance: N. H. Schlegel, H. Roehm, J. T. Williamson, J. W. Wallace, R. TenEyck, H. Hartmann, E. W. Gutgsell, W. D. Morgan, F. Power, E. J. Alexander.

Exhibiting: Electric fans, air circulators, air conditioners, humidifiers, dehumidifiers, heater fans, window fans, heaters.

CRANE CO., 836 S. Michigan Ave., Chicago 5, Ill.—Booths 134-233-235-239

In attendance: G. L. Erwin, Jr., C. E. Towner, E. P. Allen, E. B. Cole, J. J. Millner, F. J. Maurer, G. L. Ballantyne, M. W. McRae, C. J. Michael, W. J. Marston, H. W. Kuhlman, E. J. Mummert, J. W. Greene, C. O. Prickett.

Exhibiting: "Sunnyday" boiler, cast iron boiler, steel boiler line, gas fired "Basmor" boiler line, air conditioner line, horizontal furnace, hy-boy furnace, counter-flow furnace, baseboard radiant panels. The "Sunnyday" boiler and the "Crane-Line" air conditioner will be featured.

CRISE CONTROLS DIV., ACRO MFG. CO., 2040 E. Main St., Columbus, Ohio—Booth 332

In attendance: F. G. McCloskey, E. V. Bishoff, L. R. Preslan, J. D. Phillips, D. E. Kastle, T. A. Smith.

Exhibiting: Fan and limit controls, room thermostats, solenoid gas valve, zone control system, damper motors. New gas package will be featured.

CURTIS REFRIGERATING MACHINE DIV. of CURTIS MFG. CO., 1905 Kienlen Ave., St. Louis 20, Mo.—Booth 51

In attendance: Harry C. Morrison, Harry J. Nettler, Andrew M. Bono, K. T. Rockey, George Helde, Frank Hanley, Fred Havel, Charles Angell, J. E. Meade, V. P. Warren, W. Smallwood.

Exhibiting: New residential heating and cooling unit (2, 3 and 5 tons); new packaged water chillers (3 to 50 ton capacity); new 1955 room air conditioners (¾, 1 and 1½ tons); reverse cycle (heat pump) packaged air conditioners; and condensing units. Operating sectional compressor will be a feature.

CUTLER-HAMMER, INC., 315 N. 12th St., Milwaukee 1, Wis.—Booth 208

In attendance: P. S. Jones, F. A. Wright, J. M. Cook, K. M. Nelson, M. R. Brice, J. P. Simon, W. E. Addicks, R. G. Martinson, E. L. Singler, P. L. Erickson, H. E. Johnson, W. M. Reese, E. Gress, R. J. Keeler, R. A. Pancoast, D. C. McIntosh, B. C. Chamberlain, B. M. Horter, Jr., R. W. Thomas, C. L. Wymelenberg.

Exhibiting: Motor control and motor switches for fans, blowers, pumps and air conditioning equipment, manual and magnetic starters and regulators, pressure switches, float switches, thermostats, electric heaters, small motor switches, etc. New "Unitrol" motor control centers with new power jack design; "Three Star" line of a-c magnetic across-the-line starters; new combination starters with self-contained motor circuit switches or circuit breaker; a-c magnetic part winding motor controller for two step, across-the-line starting of part winding type squirrel cage motors; and a-c secondary resistor drum controller for wound rotor motors driving centrifugal compressors will be featured.

DAFFIN MFG. CO., Lancaster, Pa.—Booth C-51

In attendance: P. A. Herr, C. A. Isenberger, G. E. Sprackling.

Exhibiting: Plenum humidifier; "Hum-O-Zone" industrial humidifier; humidifier for homes, offices, greenhouses, etc.; refrigeration humidifier for food storage areas; new "Daffinaire" portable residential and office humidifier which filters and water-washes the air, discharging sufficient moisture "to humidify a six room house."

DAVIDSON FAN CO., 213 California St., Newton 58, Mass.—Booth 422

In attendance: E. F. Patterson, R. E. Mabey, J. F. Snow.

Exhibiting: Centrifugal roof exhaust fans.

DAYTON RUBBER CO., THE, Dayton 1, Ohio—Booths 443-445

DeBOTHEZAT FANS DIV., AMERICAN MACHINE & METALS, INC., East Moline, Ill.—Booth 210

In attendance: F. C. Weicker, C. J. Gaspar, R. W. Bouslough, M. G. Beline.

Exhibiting: Induced draft "Bifurcators", vane axial fan, stainless steel "Bifurcator", roof ventilator. Induced draft "Bifurcator" with electrical speed control "to provide pinpoint burner efficiency" will be featured.

DELAVAN MFG. CO., 811 Fourth St., West Des Moines, Iowa—Booth 4

In attendance: David T. Morganthaler, Nelson B. Delavan, B. S. Goreham, Eugene O. Olson, Wm. B. Spargur, Wm. Thurston, Lee N. Beardsley, A. Kenneth Johnson, H. L. McNally, Robert E. Keene.

Exhibiting: Oil burner nozzles and accessories; spray nozzles for cooling towers, evaporative condensers, humidifying and industrial applications; "Hally" nozzle filters; flame inspection mirrors, oil burner serviceman's kits; sludge solvent; nozzle boxes; jobber and dealer nozzle racks; and nozzle tools. The display racks, nozzle changer and the nozzle boxes will be featured.

DELCO PRODUCTS DIV., GENERAL MOTORS CORP., Dayton 1, Ohio—Booths S-31, S-33

DELTA HEATING CORP., 1 Cole St., Trenton 8, N. J.—Booth 150

In attendance: Edward C. Black, W. F. Briggs, H. E. Culley, Frank Steward, E. S. Cushing, Charles A. Dyson, Dick Halberg, Walter W. Coe, Saul Feinberg, A. L. Nathan, Roy C. Hauck, Nicholas Hayes, Donald P. Moore, Jerry Polland, W. J. Schonfeld.

Exhibiting: Unit heater, floor furnace, suspended furnace, hi-boy furnace, "Big Boy" hi-boy furnace, counterflow furnace, lo-boy furnace, wall furnace, "Floor-O-Lator," oil burner, gravity furnace, gun type gas burner. New "F181" oil floor furnace and new "UH" oil-fired unit heater will be featured.

DETROIT CONTROLS CORP., 5900 Trumbull Ave., Detroit 8, Mich.—Booth 35

In attendance: C. H. Hodges, Jr., E. J. Doucet, F. G. Coggin, K. B. Thorndike, R. S. Paltz, W. H. Hohmeyer, F. Y. Carter, J. Strauss, H. L. Walker, G. Yorgen, F. D. Cooper, T. C. McKee, Jr., C. U. Cole, A. Fuller, N. L. Sell, E. E. Crowley, S. A. Anderson, J. W. Carlson, B. L. Bambard.

Exhibiting: Automatic controls for air conditioning systems and gas and oil heating systems. Heating-cooling thermostat for year around air conditioning and automatic changeover valve for remote type heating-cooling units will be featured.

DEVICES, INC., 214 E. 53rd St., New York 22, N. Y.—Booth 302

In attendance: B. LeB. Musgrave, L. R. Cutler, Harold N. Davis, V. L. Yepsen, Alex O'Hare, Alex Kidd.

Exhibiting: "Miracle" surface anchors and "Protektinsul," a new pipe and duct covering finish, which will be featured.

DIEHL MFG. CO., Finderne Plant, Somerville, N. J.—Booth 739

DIELECTRIC PRODUCTS CO., INC., 125 Virginia Ave., Jersey City 5, N. J.—Booth S-37

In attendance: Phil Krueger, Henry T. Carey, Ted Roman, L. Di Nicola.

Exhibiting: Oil burner electrode assemblies, insulators, bus bar, "Rajah" terminals.

DODGE CORP., F. W., 119 W. 40th St., New York 18, N. Y.—Booth C-31

Exhibiting: Publication.

DOERR ELECTRIC CORP., Cedarburg, Wis. —Booth C-121

DOLE VALVE CO., THE, 1933 W. Carroll Ave., Chicago 12, Ill.—Booths 421-423

In attendance: J. F. Lund, S. G. Phillips, H. H. Aronson, T. G. Colter, E. K. Williams, Mitchell Love.

Exhibiting: Air and vacuum valves, automatic hot water valves, water mixers, flow controls, and automatic registers, and featuring automatic hot water air valves and shower controls.

DOLLINGER CORP., Rochester 3, N. Y.—Booth 304

DOMESTIC ENGINEERING, 1801 Prairie Ave., Chicago 16, Ill.—Booth 343

Exhibiting: Publication.

DONALDSON DIV.—see MARVIN D. SHAFER CO.

DONGAN ELECTRIC MFG. CO., 2987 Franklin St., Detroit 7, Mich.—Booth S-35

In attendance: C. E. Hicks, J. B. Evans.

Exhibiting: Oil and gas ignition transformers for industrial and domestic use. Replacement oil burner ignition transformers will be featured.

DOYLE VACUUM CLEANER CO., 225 Stevens St., S.W., Grand Rapids 2, Mich.—Booth C-22

In attendance: Walter B. Fitzgerald, Ralph C. Newton.

Exhibiting: Vacuum cleaners and attachments.

DRAVO CORP., 5th & Liberty Aves., Pittsburgh 22, Pa.—Booth 639

In attendance: Home office management and engineering personnel; eastern, midwestern and southern area sales managers.

Exhibiting: Center of attraction will be the floating stainless steel combustion chamber from a 1 million Btu "Counterflo" forced air space heater. Also exhibited will be complete "Counterflo" and "Paraflo" light oil fired heaters, and a suspended gas fired unit heater.

DRAYER-HANSON, INC., Box 2215 Terminal Annex, Los Angeles 54, Calif.—Booth 214

DUNHAM CO., C. A., 400 W. Madison, Chicago 6, Ill.—Booths C-150, C-151

In attendance: F. E. Schmidt, W. S. Browning, N. F. Sorgenfrei, J. W. O'Neil, J. S. Gregory, J. W. Jungels, H. S. Marshall, A. J. Hesmer, E. G. Powell, E. G. Keller, R. E. Sweney.

Exhibiting: Baseboard radiation, convectors, finned tube radiation, steam or hot water horizontal and vertical unit heaters, gas fired unit heaters, steam and hot water automatic temperature controls, vacuum pumps, condensation pumps, heating-cooling units, steam specialties, hot water specialties, hot water circulators. Forced flow convectors, baseboard for commercial applications, new hot water line and new electronic temperature control panel will be featured.

duPONT de NEMOURS & CO., E. I.—see KINETIC CHEMICALS DIV.

DURANT INSULATED PIPE CO. and DURANT INTERNATIONAL CORP., Palo Alto, Calif., and Williamstown, N. J.—Booth S-14

In attendance: A. H. Isenberg, William H. Buck, William R. Funk, Anthony Oswald.

Exhibiting: Presealed insulated pipe.

DURO-DYNE CORP., 800 Third Ave., New Hyde Park, N. Y.—Booth C-33

In attendance: Martin M. Gracer, Milton Hinden, Sam Alter, Arthur Harshall.

Exhibiting: "Duro-Blade" kit, "Duro-Vane" rail, "Duro-Metal-Fab", "Greyhound" portable spot welder, and recently acquired "Parker-Kalon" damper regulator sets and accessories, metal punches, file handles, solder iron handles.

DWYER MFG. CO., F. W., 317 S. Western, Chicago 12, Ill.—Booth 715

In attendance: J. G. Dwyer, P. W. Dwyer.

Exhibiting: Inclined tube gages, air filter gages, manometers, pitot tubes, pressure actuated switches, combustion test sets.

EAGAN CO., INC., WALTER H., 2336 Fairmount Ave., Philadelphia 30, Pa.—Booth 348

ECKHART MFG. CO., INC., 931 Lehigh Ave., Union, N. J.—Booth 330

In attendance: Arnold Eckhart, Sr., Walter E. Eckhart, George W. Diem, William D. Boswell.

Exhibiting: "Silent Korth" oil burners with capacities from 0.75 to 20 gph. New model SR-SH oil burner (0.75 to 1.75 gph capacity) equipped with improved combustion head with flame stability will be featured.

EDDINGTON METAL SPECIALTY CO., Eddington, Pa.—Booth 209

EJAY BASEBOARD MFG. CO., 124 Boyd St., Winsted, Conn.—Booth C-53

In attendance: Edward J. Fitzgerald, Hope Fitzgerald.

Exhibiting: Baseboard heating Model No. 566; new "Streamline" baseboard to be shown for the first time.

ELECTRIGLAS CORP., Newbridge & Windsor Rd., Bergenfield, N. J.—Booth 843

Exhibiting: Radiant heating panels.

ELECTRO-AIR CLEANER CO., 1285 Reedsdale St., Pittsburgh 33, Pa.—Booth S-9

In attendance: P. W. Aitkenhead, R. C. Aitkenhead, J. E. McGivern, E. L. Baysek.

Exhibiting: Electronic air cleaners, featuring single circuit power supply and selenium rectification of current.

ELECTRONICS CORP. OF AMERICA—see COMBUSTION CONTROL DIV.

ELECTRO-THERM, INC., 931 Selim Rd., Silver Spring, Md.—Booth 745

In attendance: James G. Lampe, Alan Metcalfe.

Exhibiting: Electric heating elements, immersion water and oil preheaters.

ELGEN MFG. CORP., 41-34 39th St., L. I. City 4, N. Y.—Booth S-92

In attendance: Albert Josephson, Louis Josephson, John J. Wyle, Bruno Speiser, Morris Goldsmith, Maurice Goodman, Lee Sobel.

Exhibiting: "Damperset," "Silent Duct," and "All-Tite" vane runner.

EMERSON ELECTRIC MFG. CO., THE, 8100 Florissant Ave., St. Louis 21, Mo.—Booths 718-722

EMERSON RADIO & PHONOGRAPH CORP. —see QUIET HEET MFG. CORP.

EMPIRE CHEMICAL PRODUCTS CO., 10 Longworth St., Newark 2, N. J.—Booth S-66

In attendance: F. M. Sevison, M. A. Travisano.

Exhibiting: Furnace cleaners.

ENGEL SHEET METAL EQUIPMENT, INC., 3001 N. Union Blvd., St. Louis 15, Mo.—Booth 16

In attendance: Charles F. Engel, Joseph R. Yoch, O. Wolters, Wm. Stoner.

Exhibiting: Tools for laying out, cutting, and notching metal—"Ductmaster," new "Shopmaster," new "Benchmaster," multiple notching units (hand operated or power operated); new "Edge Master" flanger for flanging of metal.

EUREKA WILLIAMS CO.—see WILLIAMS DIV.

EVANS CORP., THE GEORGE, 37th St., Moline, Ill.—Booth C-153

In attendance: Reid Evans, Frank Myers, Dick Evans.

Exhibiting: "Lifelong" air filter, industrial and commercial filter, industrial filter and frame, and grease filter. Exclusive "air scoop" design "with 76;060 air scoops in a 20 in. x 20 in. x 2 in. filter, whereby air is forced to travel 3.5 times the filter depth from inlet to outlet side," will be featured.

EXCELSIOR STEEL FURNACE CO., THE, 118 S. Clinton St., Chicago 6, Ill.—Booth S-65

In attendance: J. S. McDonald, E. C. Brex, I. E. Brex, D. E. Brex, E. A. Brex, G. A. Clarke, S. E. Esposito, J. B. Fehlig, R. L. Wilson.

Exhibiting: Galvanized furnace pipe and fittings; stainless steel chimney liners; blued and walnut stovepipe and elbows; AGA approved gas diverters; sheet metal specialties. A new line of galvanized pipe and fittings for small pipe perimeter installation will be featured.

FAIRBANKS CO., THE, 393 Lafayette St., New York 3, N. Y.—Booth 434

In attendance: James J. Langan, William R. Bieretz, Herbert J. Knapp, William J. Kaiser, Herbert S. Jones, Eugene T. Zittel, Robert A. Fournier.

Exhibiting: Bronze valves, iron body valves, "Dart" malleable iron unions, "PIC" steel unions. The valve display will feature two new union bonnet rising stem gate valves.

FARR CO., P.O. Box 45187, Airport Station, Los Angeles 45, Calif.—Booth 10

In attendance: R. S. Farr, W. H. Welty, F. X. Shea.

Exhibiting: "Far-Air" filter, self-washing filter, grease eliminator, and "Rotonamic," which will be featured.

FASCO INDUSTRIES, INC., N. Union at Augusta St., Rochester 2, N. Y.—Booth 306

In attendance: H. M. Sylvester, D. R. Schroedel, C. A. Button, N. S. Dean, K. J. Orr, J. M. Nolan, P. R. Reid.

Exhibiting: Shaded pole motors ranging from 1/500 to 1/8 hp., and centrifugal blowers.

FEDDERS-QUIGAN CORP., 85 Tonawanda St., Buffalo 7, N. Y.—Booth 300

FEDERAL BOILER CO., INC., 2610 E. Tremont Ave., New York 61, N. Y.—Booths 218-222

In attendance: Raymond H. Bohr, Raymond Shuster, James H. Legg, Roy M. Rathe, William Leach, George McGrath, Charles Wm. Cavanagh, Charles Lowrey, Oscar Mann.

Exhibiting: Residential heating boilers, oil fired and gas fired; commercial heating boilers; competitive heating boilers, oil fired and gas fired; baseboard. Live exhibit will show an AGA approved heating boiler producing domestic hot water from a tankless coil fired by gas.

FIELD CONTROL DIV. of H. D. CONKEY & CO., Mendota, Ill.—Booth C-24

In attendance: C. W. Potter, Henry Remsberg, H. J. Potter, E. A. Field, manufacturers' representatives from the United States and Canada.

Exhibiting: Barometric draft controls, gas controls, incinerator controls, stove and range controls, domestic gas controls. Type "RCG" domestic gas controls and type "SNA" incinerator controls will be featured.

FITZGIBBONS BOILER CO., INC., 101 Park Ave., New York 17, N. Y.—Booths 525-531

In attendance: P. K. Addams, J. R. Collette, G. Nelligann, G. E. Olsen, W. O. Spiess, F. W. Harmer, R. E. Ross, F. G. Stellwagen, H. C. Roehm, A. R. Rossbach, R. J. Wickel, E. W. Skoglin, F. M. Butler, W. N. Hall, W. C. Wetherstine, E. N. Black, III, G. T. Kohler, M. F. May, R. W. James, R. E. Toms, R. S. Brenton, F. A. Dockeray, A. E. Powers, W. T. Feely, A. Stellingworth, J. J. Weeks, A. P. Goodyer, W. A. Johnson, W. Skowronek, R. Peckham, A. W. Nugent, H. O. Beadle.

Exhibiting: Commercial boiler-burner package, gas boiler unit with "Tanksaver," new type "D" boiler, boiler-burner unit, cutaway "R-Z-U Junior" boiler. The commercial boiler-burner package and the "770" gas boiler unit will be shown for the first time.

FLEXIBLE TUBING CORP., Guilford, Conn. —Booth C-156

In attendance: F. K. Daggett, W. L. Guiles, R. H. Pulton, H. W. James.

Exhibiting: "Thermaflex," a new type of branch ducting for high and low pressure air conditioning systems.

FLEXONICS CORP., 1315 S. 3rd Ave., Maywood, Ill.—Booth S-127

In attendance: M. D. Thackaberry, D. E. Wolf, L. R. Taylor, G. W. Derum, J. H. Zabel, W. J. Ribbentrop, A. C. Winter, M. J. Mitchell, R. M. Quick, T. K. Wells, E. L. Hiter, H. V. Tastrom.

Exhibiting: "Vibra Sorbers," expansion joints, expansion compensator for low pressure steam and hot water, flexible metal hose. Special expansion compensators for domestic heating systems will be featured.

FOOD MACHINERY AND CHEMICAL CORP.—see PEERLESS PUMP DIV.

FOREST CITY FOUNDRIES CO., NIAGARA FURNACE DIV.—see NIAGARA FURNACE DIV.

FOSTORIA PRESSED STEEL CORP., Fostoria, Ohio—Booth C-117

In attendance: R. H. Carter, E. W. Kuhn, R. W. Jeffery, J. J. Sweeney.

Exhibiting: "Dynapump" magnetic fractional horsepower circulator or booster pump, featuring the performance and improved "Silent Night" flange designed to insure a quiet installation.

FREEMAN DIV., ILLINOIS IRON & BOLT CO., Carpentersville, Ill.—Booths S-112 & S-114

In attendance: J. M. McClintock, J. M. Mullaney, Fred W. Cochrane, Frank Schroeder.

Exhibiting: "Burdett" gas conversion burner, oil and gas fired furnaces, stokers, incinerators, oil burners.

FRICK CO., West Main St., Waynesboro, Pa. —Booth 317

In attendance: P. H. Buch, C. C. Smith, R. H. Moore, M. W. Garland, W. H. Aubrey, W. O. Kline, T. Mitchell, M. B. Watts, J. Alvarez, R. M. Shuford, R. A. Ebner, P. A. Willis, J. T. Murphy, Cyril Leech, W. J. Dugas, H. F. Burpee, David Eddy, J. A. Etter, R. W. McFerren.

Exhibiting: A four-cylinder "Eclipse" compressor cut-away and operating in slow motion; a working model of a new square-finned cooling coil, kept frosted by a refrigerating unit; unit air conditioner, a "Shell-ice" maker; valves, fittings and machine parts. The finned coil, ice maker and type ASF safety valve will be shown for the first time.

FRIGIDAIRE DIV., GENERAL MOTORS CORP., Dayton 1, Ohio—Booths 52-54

Exhibiting: Self-contained "Master-matic" air conditioner (cutaway model); year 'round air conditioner (cooling and heating combined); 2, 3, and 5 ton capacity "Multi-matic" air conditioners (used in conjunction with any forced air furnace); 1955 model room air conditioners; representative model water cooler.

FUELOIL & OIL HEAT, 2 W. 45th St., New York 19, N.Y.—Booth 108

Exhibiting: Publication

FULTON SYLPHON DIV., ROBERTSHAW-FULTON CONTROLS CO., P.O. Box 400, Knoxville 1, Tenn.—Booths 334-336

In attendance: L. S. Dysart, E. D. Rogers, M. G. Calhoun, D. D. Gordon, G. E. McKinney.

Exhibiting: Temperature controls, pressure controls, automatic radiator valves, steam-water mixers, hot-cold water mixers, room thermostats, packless valves, bellows and bellows assemblies, float valves, bellows motor valves. "Fultrol" thermostatic pilot controller for hydraulic or pneumatic control systems, float valve for liquid level control, mixer for mixing hot and cold water for tempered water supply, mixer for mixing steam and water for hot water supply, bellows motor valve for pneumatic or hydraulic control systems, and room thermostat of line voltage type for electric heating systems, stokers and oil burners are new products.

GALLAHER CO., THE, 4108 Dodge St., Omaha 3, Neb.—Booth 248

In attendance: J. J. Solzman, David Solzman, Alfred Petersen, Richard Holland.

Exhibiting: Centrifugal power roof exhauster, both direct drive and belt driven types.

GAS HEAT, 2 W. 45th St., New York 19, N.Y.—Booth 108

Exhibiting: Publication

GENERAL AUTOMATIC PRODUCTS CORP., 2300 Sinclair Lane, Baltimore 13, Md.—Booth 14

In attendance: Robert E. Lee, Claude W. Schaefer, Howard J. Hughes, Harold F. Browning, Walter R. Way, Robert M. Hodgdon.

Exhibiting: Hot water and warm air baseboard, gas fired boilers, winter air conditioners, oil fired boiler.

GENERAL BLOWER CO., 8606 Ferris Ave., Morton Grove, Ill.—Booths 425-427

In attendance: James E. Clark, R. P. Scott, H. Edward Gross, I. A. Fern, J. J. Ferretti, I. Kahn, Robert Bacon.

Exhibiting: Backward blade and forward curve centrifugal fans, multi-vent sets, industrial exhausters, industrial propeller fans, centrifugal roof ventilator, turbo pressure blowers.

GENERAL CHEMICAL DIV., ALLIED CHEMICAL & DYE CORP., 40 Rector St., New York 6, N.Y.—Booths S-95 and S-97

In attendance: H. L. Robbins, L. D. Callans, Dr. F. E. Medon, Henry Burki, W. B. Sherry, J. J. Tomlinson, and sales representatives from nationwide company offices.

Exhibiting: "Genetron Super-dry" refrigerants, including 11—orange label—trichloromonofluoromethane; 12—white label—dichlorodifluoromethane; and 141—green label—monochlorodifluoromethane.

GENERAL CONTROLS CO., 801 Allen Ave., Glendale, Calif.—Booth 56

In attendance: J. F. Ray, F. Weldon, J. Wolff, S. Andrews, L. Liepin.

Exhibiting: Automatic controls for heating and appliances. Heating thermostat, air conditioning thermostat, limit controls and air conditioning control panel will be featured.

GENERAL ELECTRIC CO., AIR CONDITIONING DIV., COMMERCIAL AND INDUSTRIAL AIR CONDITIONING DEPT., 5 Lawrence St., Bloomfield, N.J.—Booth C-113

In attendance: F. J. Van Poppelen, J. S. Beldon, G. K. Iwashita, W. F. R. Karsten, J. J. Heffernan, M. N. Thrall, C. W. Leegard, C. J. Rigby, R. D. Roley, B. Natkin.

Exhibiting: Packaged air conditioners and drinking water coolers for business and industry.

GENERAL ELECTRIC CO., AIR CONDITIONING DIV., WEATHERTRON DEPT., 5 Lawrence St., Bloomfield, N.J.—Booth 347

In attendance: F. J. Van Poppelen, J. S. Beldon, H. M. Brundage, H. L. Williamson, W. G. Cox, H. N. McMenimen, P. B. Hoppin.

Exhibiting: Completely new "Weathertron" packaged heat pump.

GENERAL ELECTRIC CO., (APPARATUS DIV.), 1 River Rd., Schenectady 5, N. Y.—Booths 933-935

In attendance: P. Gomez, W. T. Goldsmith, B. R. Elam, R. D. Tyler, K. Recktenwald, H. E. Smith, E. B. O'Hora, E. F. Rhodes, W. F. Brunner, J. Amsterdam, C. J. Ossenfort.

Exhibiting: "Tri-clad" induction motors, fractional hp fan and blower motors, leak detector, heating controls, general purpose Fhp motors. New "Tri-clad 55" motor and 39 frame Fhp motor will be featured.

GENERAL FILTERS, INC., 43800 Grand River Ave., Novi, Mich.—Booth 6

In attendance: Robert G. Gregory, Roland A. Redner, Mrs. Grace Redner, and others.

Exhibiting: Complete line of fuel oil filters for both light and heavy fuel oils, water trap for bottom opening fuel oil tanks; "Unifilter" combination filter, valve and fittings for space heaters; "Clean Right" soot remover.

GENERAL FITTINGS CO., 123 Georgia Ave., Providence 5, R.I.—Booth S-36

GENERAL GAS LIGHT CO., 202 N. Park St., Kalamazoo, Mich.—Booth 313

In attendance: Alfred H. Humphrey, Robert P. Humphrey, William H. Jackson, Clifford G. Weirs, W. N. Blinks, W. F. Kite, Norris Blanchard, D. R. Bayers, Alfred M. Slattery, Julius A. Meier, Harold M. Jay, R. O. Berry, R. M. Kinney, Sidney L. Katz, Henry Zehner, Glenn A. Frey, Thos. F. McNally, Russell F. Streff, W. A. Hart.

Exhibiting: Propeller fan and blower unit heaters, duct furnaces, furnaces, circulating heaters, radiant heaters, panel heaters. The panel heaters, duct furnaces and the furnaces will be featured.

GENERAL HEATING PRODUCTS CO., 7426 State Rd., Philadelphia 36, Pa.—Booth S-57

In attendance: Paul H. Bunten, Charles Rihl, Joseph Myers.

Exhibiting: "Thriftmaster" tubeless boilers, gas and oil fired; baseboard radiation; convector radiation; "Aire-trim" baseboard radiation (forced warm air); winter air conditioners (forced warm air) high and low boys; "V-T" tube boilers, oil fired.

GENERAL MOTORS CORP.—see FRIGIDAIRE DIV.

GENERAL PLATE DIV.—see METALS & CONTROLS CORP.

GENERAL REGISTER CORP., 14 Factory St., Cedar Grove, N.J.—Booth C-40

In attendance: B. Philip Harding, Russell D. Anderson.

Exhibiting: New and complete line of air conditioning registers and grilles.

GERWIN INDUSTRIES, INC., 214 Spring St., Michigan City, Ind.—Booth S-101

In attendance: L. C. Cotts, Frank Davenport, Charles Murman, Edward Black, O. W. Dobson, C. J. Baldwin, A. L. Yeager.

Exhibiting: "Thermo-Base" warm air baseboard heat distributors.

GIBSON INDUSTRIES, 965 W. Western Ave., Muskegon, Mich.—Booth S-113

In attendance: Harry E. Gibson, T. S. House, H. E. Sante, S. P. Ruster, Harold McCormick.

Exhibiting: "Mipatan" electric hammer for corner locks and "Mipatan" air hammer for shops equipped with air.

GOODFELLOW CO., INC., E. D., 496 E. Bodley Ave., Memphis 2, Tenn.—Booth 614

In attendance: E. D. Goodfellow, Chas. E. Goodfellow, W. T. Dawkins, C. L. Goodfellow, T. Fuller.

Exhibiting: Induced draft cooling towers and centrifugal pumps.

GOODYEAR TIRE & RUBBER CO., THE, 1144 E. Market St., Akron 16, Ohio—Booth 939

GOULDS PUMPS, INC., 300 Fall St., Seneca Falls, N.Y.—Booth C-20

In attendance: C. L. Forshee, P. J. Olmstead, S. S. Gould.

Exhibiting: Centrifugal pumps for air conditioning and general service applications.

GOVERNAIR CORP., 513 N. Blackwelder, Oklahoma City 4, Okla.—Booth 601

In attendance: W. A. Quinn, J. B. Quinn, A. M. Keyser, H. R. Krueger, C. K. Fitzgerald, W. H. Moler, W. H. Hollingsworth, Harold Feldstein, R. S. Oakleaf, R. O. Emery, R. E. Keller, W. S. Farnum.

Exhibiting: Self-contained air conditioner with evaporative condenser, packaged air conditioner, air handling unit, and blast coil.

GRAHAM MFG. CORP., 1541 E. Eight Mile Rd., Ferndale 20, Mich.—Booth S-98

In attendance: George A. Crandall, Richard F. Saro, P. H. Vollman.

Exhibiting: "Insul-Pin" system. Model 6000-D "Insul-Pin" welder will be introduced.

GUSTIN-BACON MFG. CO., 210 W. 10th, Kansas City 5, Mo.—Booth 740

In attendance: M. F. Hauserman, Jr., F. W. Muller, G. P. Oldham, K. H. Crone, Barth Gilchrist, L. E. Feitt, G. P. Corlis, F. J. Kane.

Exhibiting: "Ultralite" duct insulation and liner. New "G-B Snap On" pipe insulation molded of fine glass fibers will be featured.

HALSTEAD & MITCHELL, Bessemer Bldg., Pittsburgh 22, Pa.—Booth C-36

In attendance: Byron Halstead, William Rapp, William Moffitt, Horace I. Schmidt, Thomas Scott, Theodore Smith.

Exhibiting: Cooling towers and condensers, featuring "Take-Apart" cooling tower and centrifugal fan cooling tower.

HARRIS & CO., ARTHUR, 210-218 N. Aberdeen St., Chicago 7, Ill.—Booth 620

HART & COOLEY MFG. CO., 500 E. 8th St., Holland, Mich.—Booth 610

In attendance: G. D. Heeringa, E. J. Rowder, J. H. Van Dyke, G. J. Braun, W. K. O'Brien, R. C. Smeenge, R. W. Gordon, G. W. Copeland, P. W. Winchester.

Exhibiting: Registers, grilles and diffusers for warm air heating and air conditioning systems. Baseboard diffusers for perimeter heating and cooling will be featured.

HASTINGS AIR CONTROL, INC., 3215 Leavenworth St., Omaha, Nebr.—Booth S-45

In attendance: Milton S. Frankle, Felix Roth, Werner Lindeman, Bill Seymour, Phineas Wintroub, Richard L. Wintroub.

Exhibiting: Air conditioning equipment, power conversion gas burners, gas unit heaters, "Hoist-It" hoisting equipment. "Double-Kool" units "which produce 2 tons of refrigeration per compressor horsepower," utilizing water up to 70 deg will be featured. Air is precooled in four row, all copper water coil and then further cooled and dehumidified in all copper DX coil, which feature permits use of up to 100 percent outdoor air for ventilation.

HEATING, AIR CONDITIONING, SHEET METAL CONTRACTOR, 92 Martling Ave., Tarrytown, N.Y.—Booth C-18

Exhibiting: Publication.

HEATING, PIPING & AIR CONDITIONING, 6 N. Michigan Ave., Chicago 2, Ill.—Booth 12

In attendance: Charles E. Price, Wallace J. Osborn, Robert A. Jack, C. M. Burnam, Jr., Robert W. Roose, George C. Cutler, Thomas V. Johnson, Robert J. Osborn, James E. Sacra, David V. Mahan.

Exhibiting: Heating, Piping & Air Conditioning magazine; market information.

HEATING AND VENTILATING, 148 Lafayette St., New York 13, N. Y.—Booth C-12

Exhibiting: Publication.

HEAT-TIMER CORP., 657 Broadway, New York 12, N.Y.—Booth C-34

In attendance: Edward J. Zeitlin, Harry Zeitlin, Albert Fowler, Lee Leighton.

Exhibiting: Electronic heating control, "Varivalve," "Thermovalve," main line quick vent valve, new heat recorder-totalizer, new heat totalizer, motorized valves, new smoke eye control, new oil burner fire alarm.

HEIL CO., THE, 3000 W. Montana St., Milwaukee 1, Wis.—Booths 122-126-132

In attendance: John Barclay, Geo. Hochstein, D. E. Fricker, Wm. A. Matheson, Robert Rose, John Huber, Harold Wilkinson, Alex Eunson, Ken Johnson, Richard Berry, Roy King, Fred Bittner, Karll Mould, Fred Brubaker, Charles Kahl, Geo. Katzenberger.

Exhibiting: Conversion oil burner, (with "Perfex Ray"); conversion oil burner (with low pressure pump); new conversion gas burner; new highboy furnace (plus horizontal water cooled air conditioner); oil fired furnace (plus water cooled air conditioner); oil fired furnace (plus air cooled air conditioner); oil fired lowboy builder's model furnace; oil fired horizontal furnace; gas fired horizontal furnace; gas boiler; oil boiler.

HENNEY MOTOR CO.—see WILLIAMS DIV.

HENRY FURNACE CO., Medina, Ohio—Booths 36 & 57

In attendance: J. Crombie, E. J. Marre, J. S. Garber.

Exhibiting: "Moncrief" combination heating and cooling year 'round air conditioning units (gas and/or oil fired heating); summer air conditioning units (self-contained and remote types, air and water cooled); gas and/or oil fired basement, utility, horizontal and counterflow winter air conditioning units; gas and/or oil fired gravity furnaces; gas fired unit heaters; gas conversion burners; oil conversion burners; blower-filter units; gas incinerators; and "Surefit" warm air duct fittings and registers. New counterflow combination year 'round air conditioning units in two sizes, new 5 ton air conditioner, and gas fired unit heaters will be featured.

HERBSTER PRODUCTS CO., 877 Addison Rd., Cleveland 3, Ohio—Booth S-22

In attendance: William L. Schmiler, Leon Kenney, Donald Aingworth, Ralph E. Stinson, Ferd D. Miller.

Exhibiting: Furnaces and furnace-dryer combinations with cast iron "Torcon" heat exchanger.

HERCO OIL BURNER CORP., 131 Locust St., Lancaster, Pa.—Booth S-108

In attendance: Harry B. Rohrer, Ray W. Mummaw.

Exhibiting: High and low pressure oil burners, packaged warm air furnaces, packaged boiler-burner units. New model HLP-1 low pressure oil burner will be featured.

HERRING-HALL-MARVIN SAFE CO.—see QUICKDRAFT CO.

HI-FLOW PRODUCTS, INC., 4524 Harford Rd., Baltimore 14, Md.—Booth 727

In attendance: Clarence Meyer, Philip Seligson, Ed Berry, C. N. Rink, George Schaefer, Gilbert Sandler.

Exhibiting: Hot water heating specialties including flow-tees, venturi tees, radiant manifolds, twin-tube baseboard manifolds, corner compression connectors for cast iron baseboard radiation, purging and balancing assemblies: New types of radiant heat manifolds, and "Equa-Valve" for the balancing, venting and purging of a hot water baseboard loop system will be featured.

HOFFMAN SPECIALTY MFG. CORP., 1700 W. 10th St., Indianapolis 7, Ind.—Booth 802

In attendance: Neil D. Skinner, A. O. Roche, Jr., W. W. Dillon, R. G. James, J. T. Haffner, Merrill Blankin.

Exhibiting: Commercial wall radiation, baseboard radiation, circulators, flow control valves, expansion tanks, distribution flow tees, vent valves, condensate and vacuum pumps, supply valves, and thermostatic traps.

HOMEASE PRODUCTS DIV., 52 Iowa Ave., Paterson 3, N.J.—Booth 407

HOWARD INDUSTRIES, INC., 1760 State St., Racine, Wisc.—Booth S-75

In attendance: E. J. Hansen, J. R. Melvin, W. A. Ernst, W. E. Macbeth, E. C. Spaay, R. Bulis, Wm. Fay, Ragnar Johnson.

Exhibiting: Fractional horsepower electric motors, featuring a permanent split capacitor motor for the air conditioner industry.

HUCK MFG. CO., 2480 Bellevue, Detroit 7, Mich.—Booth S-124

HYDRALINE PRODUCTS DIV., BORG-WARNER CORP., 18538 Mack Ave., Detroit 36, Mich.—Booth 436

In attendance: C. S. Davis, Jr., J. W. Pulkinghorn, V. W. Mayer.

Exhibiting: Year-'round remote room conditioner for forced water, combination hot water boiler and liquid chiller package, slip-on type pipe insulation.

HYDRECO DIV., THE NEW YORK AIR BRAKE CO., 1100 E. 22nd St., Cleveland 17, Ohio—Booths C-27, C-29

HYDROTHERM, INC., Clinton Ave., Northvale, N. J.—Booth 836

In attendance: J. F. Baier, W. F. Hosmer, H. D. Staman.

Exhibiting: Gas fired, cast iron, hot water boilers, featuring units from 45,000 to 170,000 Btu capacity, factory assembled and wired.

HY-LO BURNER CO., INC., Bristol Pike, Eddington, Pa.—Booth C-28

In attendance: Charles B. Wells, K. L. Leatherman, Edward Pienta.

Exhibiting: High and low pressure oil burners for domestic applications and conversions; burner-boilers and furnace-burners. Firing set-up demonstrating the low pressure burner will be featured.

ILG ELECTRIC VENTILATING CO., 2850 N. Pulaski Rd., Chicago 41, Ill.—Booth 633

In attendance: J. M. Frank, J. J. Friedler, Jr., C. W. Dexter, G. C. Jelliffe, J. O. Lennon, C. W. Stewart, W. G. Thomas, C. E. Taylor, R. J. Kemly, C. E. Brock, W. T. Trowbridge, C. F. Phillips, Jr., H. T. Darnall, F. A. Leser, R. F. Long.

Exhibiting: Fans—propeller, centrifugal, window, circulating, kitchen, darkroom, man cooler, roof and marine; unit heaters—steam, hot water, gas and all-electric; power roof ventilators. New line of steam unit heaters in horizontal, vertical and textile types will be featured.

ILLINOIS ENGINEERING CO., 2035 S. Racine Ave., Chicago 8, Ill.—Booths C-109 and C-110

In attendance: C. A. Pickett, J. L. Ehretsman, R. W. Leutwiler, L. Moore.

Exhibiting: Steam heating system equipment, steam heating system controls, steam power equipment. A glass model steam trap and standard float and thermostatic trap operating under steam will be featured.

ILLINOIS IRON & BOLT CO.—see FREEMAN DIV.

ILLINOIS TESTING LABORATORIES, INC., 420 N. LaSalle St., Chicago 10, Ill.—Booth 805

In attendance: W. J. Bailey, C. O. Wilson, G. F. Bertrand, D. Stuckey.

Exihibiting: Temperature measuring and controlling instruments, air measuring instruments, dew point measuring instruments.

IMPERIAL BRASS MFG. CO., THE, 1200 W. Harrison St., Chicago 7, Ill.—Booth 202

In attendance: T. A. Byrnes, R. H. Burk, E. Riasl, T. Durr.

Exhibiting: 45 deg and 37 deg flared, compression "Hi-Duty," "Ermeto," "Poly-flo" and brass pipe fittings, tube fittings for LP gas, refrigeration tube fittings, valves, driers, liquid indicators and service tools, fluid control valves, "Hi-Duty" pressure hose and re-usable couplings, shut-off valves and tubing tools. Fluid control valves which include needle, toggle, blowdown and test valves; "Blue Dot" benders which bend both hard and soft tubing; new "Magic Eye" liquid indicator for refrigeration systems, and "Poly-Flo" fittings and plastic tubing for making up medium and high pressure hose lines will be featured.

INDEPENDENT REGISTER CO., THE, 3747 E. 93rd St., Cleveland 5, Ohio—Booth 701

In attendance: B. N. Richardson, A. H. Ullman, K. B. Solberg.

Exhibiting: Registers and grilles for heating, cooling and ventilating. A large "Fabrikated" grille for commercial work will be featured.

INDUSTRIAL SOUND CONTROL, INC., 45 Granby St., Hartford 12, Conn.—Booth S-27

INFRA INSULATION, INC., 525 Broadway, New York 12, N.Y.—Booth S-104

In attendance: J. R. Schwartz, Mrs. Tina Schwartz, William C. Ely, Jr., James J. Fallon, Henry Sokolow, L. Wylde.

Exhibiting: Full-depth edge-to-edge insulation.

INGERSOLL-RAND CO., 11 Broadway, New York 4, N.Y.—Booth 901

INSULATING CONCRETE CORP., 3100 K St., N.W., Washington 7, D.C.—Booth 118

In attendance: Edward B. Reinhard, M. T. Phillips, John C. Simpson.

Exhibiting: Underground pipe insulation.

INTERNATIONAL HEATER CO., 101 Park Ave., Utica 2, N.Y.—Booth 514

In attendance: J. J. Hildebidle, I. C. Barber, Elwood Hesch, Millar Wheeler, James Bond, William Landmesser, C. T. Moyer, Sr., C. T. Moyer, Jr., Jack Bennett, Jack Kaley, Lee Lininiger, Morgan Johnston.

Exhibiting: Assembled and non-assembled oil and gas counterflow, gravity, hi-boy and lo-boy furnaces; oil burning boiler. A new oil fired horizontal furnace will be featured.

INTERNATIONAL MFG. CO., 515 W. Main St., Oklahoma City, Okla.—Booth 825

IRON FIREMAN MFG. CO., 3170 W. 106th St., Cleveland 11, Ohio—Booth 60

JACKSON AND CHURCH, FURNACE DIV., 321 N. Hamilton St., Saginaw, Mich.—Booths 102-106

In attendance: C. W. Stuart, D. L. Perrot, L. S. Redford, F. C. Adams, Frank Young, Ray Boland, Arthur Pracker, Arthur Duwe, Paul Deuble, R. J. Hoover, H. K. Beck. Earle Schroeder, Robert Goughnour, Herbert Robinson.

Exhibiting: Warm air heating equipment—suspension units, large industrial basement models, commercial industrial counterflow and hi-boy models. New gas fired suspension equipment, oil fired suspension equipment, and basement equipment will be featured.

JANITROL HEATING & AIR CONDITIONING DIV., SURFACE COMBUSTION CORP., Toledo 1, Ohio—Booths 15-17-19

JEFFERSON ELECTRIC CO., 25th and Madison, Bellwood, Ill.—Booth 820

Exhibiting: Complete line of ignition transformers.

JENKINS BROS., 100 Park Ave., New York 17, N.Y.—Booth 450

JENN AIR PRODUCTS CO., INC., 333 N. Penn. St., Room 515, Indianapolis 4, Ind. —Booth 27

In attendance: G. V. Patterson, H. J. Kennedy, L. J. Jenn, Edw. Filkins, Ed Niederhofer, John F. Scanlan.

Exhibiting: Roof and wall mount spun aluminum exhaust fans. Entire new line of roof exhaust fans with many new cfm capacities will be exhibited.

JOHNSON CO., S. T., P.O. Box 223, Bridgeport, Pa., and 940 Arlington Ave., Oakland 8, Calif.—Booths 822-824-826

In attendance: D. E. Johnson, Al Dimick, Robert P. Johnston, W. E. Lees, Frank Scalia, W. S. Harlacher, A. V. Leudemann, Earl Cox, E. W. Mears.

Exhibiting: Oil burners, combination oil and gas burners, boiler-burner units, furnace-burner units, water heaters, and gas boilers. New oil burner with metering pump will be featured.

JOHNSON SERVICE CO., 507 E. Michigan St., Milwaukee 2, Wis.—Booths 42-44-46

In attendance: M. M. Herrick, L. C. Carlsen, D. L. Plewes, W. L. Whalen, L. A. Davidson, G. A. Lillie.

Exhibiting: Automatic temperature and humidity controls as applied to school, hospital, industrial and public building installations.

JOHNS-MANVILLE SALES CORP., 22 E. 40th St., New York 16, N.Y.—Booth 702

In attendance: E. C. Koch, J. R. Allen, T. R. Gillan, R. A. Cimiotti, E. J. Sullivan, C. B. Hahn, H. Ickler, E. F. Ott, C. H. Dolan, S. V. Flynn, J. L. Lach, J. H. Dale, J. H. Chidester, G. F. Crumlish, T. P. Williams, H. E. Nixon, W. T. Huber, T. J. Carley, V. D. Suiter, T. Amader, W. T. Colborn, R. J. Madigan, J. Ebert.

Exhibiting: Thermal insulations and refractories; packings and gaskets; "Transite" warm air duct and gas vent; "Spintex" home insulation.

JOURNAL OF PLUMBING, HEATING, AIR CONDITIONING CONTRACTORS, 92 Martling Ave., Tarrytown, N.Y.—Booth C-18

Exhibiting: Publication

KAISER CO., E. B., 2114 W. Lake Ave., Glenview, Ill.—Booth 247

In attendance: Edw. B. Kaiser, Jr., J. Daniel Rupert.

Exhibiting: Underground and overhead insulated "Ebko" prefabricated piping systems, counterflow stack type heat exchangers, combination tank and suction heaters, tank heaters and preheaters, viscous liquid systems.

KAISER ALUMINUM AND CHEMICAL CORP., 1924 Broadway, Oakland 12, Calif.—Booth S-32

KAUSTINE FURNACE & TANK CORP., Perry, N.Y.—Booths 305-307

In attendance: J. B. Mollnow, Sr., R. E. Preine, Harry Oxenreider, W. F. Stahl, Jerry Boitano, Maurice Gutman, J. B. Mollnow, Jr.

Exhibiting: Oil fired winter air conditioning furnaces and new gas fired winter air conditioning furnaces.

KEENEY PUBLISHING CO., 6 N. Michigan Ave., Chicago 2, Ill.—Booth 12

In attendance: Chas. E. Price, Wallace J. Osborn, Robert A. Jack, C. M. Burnam, Jr., George C. Cutler, Clyde M. Barnes, Robert W. Roose, Thomas V. Johnson, James E. Sacra, David V. Mahan.

Exhibiting: Heating, Piping & Air Conditioning magazine; American Artisan magazine; market information.

KENNARD CORP., 1819 S. Hanley Rd., St. Louis 17, Mo.—Booths C-30 and C-32

In attendance: Ben M. McDougall, Sam M. Kennard, III, W. Boardman Jones, Jr., Fred W. McKenna, E. John Hill.

Exhibiting: Heating and cooling coils, 3 and 5 ton cooling towers, 10 ton liquid chiller, and scale model of a multi-zone unit. Development of a contour fin designed to increase the heat transfer on the air side of cooling and heating coils "will be previewed."

KENT CO., INC., THE, Corner Canal and S. James Sts., Rome, N.Y.—Booth 447

In attendance: Ed P. Wittischiebe, Leon L. Steele, George W. Blanchard, Ken Frames, Phil V. Hugues, Phil T. Hugues, Joe Hugues.

Exhibiting: Double suction furnace cleaner with extra dirt receptacle tank.

KEWANEE-ROSS CORP., 101 Franklin St., Kewanee, Ill.—Booths 43 & 45

In attendance: W. C. Russell, E. M. Palmer, Ben H. Schulze, C. E. Bronson, J. H. Hartman, C. K. Ferguson, E. E. Druin, G. C. Zang, H. W. McClure, E. J. Lambrecht, Tom B. Mansfield, C. R. Dougherty, T. F. Maher, Jr., R. M. Turner, L. W. Charlet.

Exhibiting: Steel boilers.

KINETIC CHEMICALS DIV., E. I. du PONT de NEMOURS & CO. (INC.), 7520 Nemours Bldg., Wilmington 98, Del.—Booth 335

In attendance: R. J. Thompson, W. A. Bours, III, A. H. Lawrence, R. L. Williams, Charles Wirth III, R. B. Sangston, J. A. Landt, J. G. Gordon III, Dr. D. E. Kvalnes, D. C. McSorley, J. E. Lincoln.

Exhibiting: "Freon" fluorinated hydrocarbon refrigerants for use in air conditioning equipment.

KINNEY MFG. CO., Subsidiary of the NEW YORK AIR BRAKE CO., 3529-3541 Washington St., Boston 30, Mass.—Booths C-27, C-29

KODY BLOWER CO., 1150 Southard St., Trenton 5, N.J.—Booth S-6

In attendance: Morris Kody, James MacG Means, Marshall P. Oothout, V. C. Snowberger.

Exhibiting: Tube axial fans, direct and belt driven for ordinary and high temperature applications; powered roof fans, both hooded and upblast type; venturi orifice fans; portable and stationary man coolers; portable vent sets; bisected or bifurcated fans; cast aluminum propellers. Stainless steel tube axial and bisected or bifurcated fans for chemical resistance and high temperature applications will be featured.

KORFUND CO., INC., THE, 48-15 32nd Pl., Long Island City 1, N.Y.—Booth 548

In attendance: S. Rosenzweig, D. Vance, J. Harris, J. Weindling, R. Haring, E. G. Haring, N. Creash, L. Perlow, A. Ruf, J. Hammond, J. Welch.

Exhibiting: Duplex twin rail fan and motor base, steel spring isolators, "Elasto Rib," cork products. Type "VPS-L Elasto Rib" damper will be featured.

KRITZER RADIANT COILS, INC., 2901 W. Lawrence Ave., Chicago 25, Ill.—Booth 732

In attendance: C. G. Newton, L. D. Mandell, E. J. Hoppe, C. C. Schedler, C. N. Rink, J. K. MacLean, D. M. Archer, C. B. Sechtig, K. Jernstrom.

Exhibiting: Baseboard units, fin pipe radiators, radiant coils, finned pipe, new indirect ferrous and non-ferrous finned heating surface, finned tubing, brazed end valves, hand and modulating radiator valves for steam and hot water systems, and solder joint valves. "K" line baseboard and slope top baseboard will be featured.

KRUEGER AIR CONDITIONING CO., 19 E. Rillito St., Tucson, Ariz.—Booth S-122

LAMNECK DIV.—see CLAYTON & LAMBERT MFG. CO.

LAU BLOWER CO., THE, 2001 Home Ave., Dayton 7, Ohio--Booth 72

In attendance: Bruce D. Epstein, E. V. Sullivan, T. I. Byrd, H. W. Faulkender, J. B. Burrowes, W. H. Wentling.

Exhibiting: Attic fans, window fans, blowers, and featuring the "Econo-Pak," blower, which provides five air discharge positions and 10 variations in motor mounting with the single package for residential heating and air conditioning.

LEWIN-MATHES CO., 1111 Chouteau Ave., St. Louis 2, Mo.—Booth 709

In attendance: Alan B. Lewin, Rod J. Lewin, James Dreyer, Larry Fries, Henry Stucke, Frank Patrick.

Exhibiting: Seamless copper tubing in sizes ⅛ in. through 6 in. A miniature sized scale model draw bench will be drawing copper tubing.

LIBBEY-OWENS-FORD GLASS CO., Toledo 3, Ohio—Booth 34

LIMA REGISTER CO., THE, 651 N. Baxter St., Lima, Ohio—Booth 74

In attendance: H. R. Pataky, C. J. LeMaster, R. B. Morey, H. F. Robinson, C. B. Armour.

Exhibiting: Diffusers, registers, and grilles for heating and air conditioning. New extended baseboard diffuser and new square ceiling diffuser will be featured.

LIPMAN DIV., YATES AMERICAN MACHINE CO., 701 Fourth St., Beloit, Wis.—Booth 117

In attendance: Fred H. Kibler, M. W. Anderson.

Exhibiting: Water and air cooled packaged air conditioners, automatic ice cubers, and an ice crusher.

LOCKFORMER CO., 4615 W. Roosevelt Rd., Chicago 50, Ill.—Booth 731

In attendance: George W. Lamberson, Harold G. Flagler, Edward C. Bill, John L. Davis.

Exhibiting: Standing S-cleat rolling machine, "Lockformer" with auxiliary double seam rolls, "Lockformer" with flanging attachment, complete power slitter, "Cleatformer," "Easy Edger." New "Snap Lock" machine will be shown for the first time.

LYCOMING DIV., AVCO MFG. CO.—see SPENCER HEATER

MAGNAFLOW PUMP CORP., 7 Elm St., Westfield, N. J.—Booth S-105

In attendance: S. H. Gamp, T. D. Propper, D. N. Mueller, M. R, Kovner, C. M. Cowan, and field representatives.

Exhibiting: Pumps.

MAGNETROL, INC., 2110 S. Marshall Blvd., Chicago 23, Ill.—Booths 417-419

In attendance: Lester E. Stybr, Richard J. Haupt and local sales representatives.

Exhibiting: Boiler water level controls, and industrial controls for liquid level and flow applications for "practically any liquid at any pressure and temperature" will be featured.

MAID-O'-MIST, INC., 3217 N. Pulaski Rd., Chicago 41, Ill.—Booth 648

In attendance: O. V. Woolley, H. J. Carr, J. A. Madden, J. L. Edgar, C. W. Byrum, F. G. French, H. T. Waterstraat, E. J. Busch, Dean Hicks, James McEntee, Joseph O'Connor, Wm. Mussun, Ralph Frey, George C. Hench, I. Roy Guild, Edward E. Berthet, W. H. Wilkinson, H. E. Culley, M. D. Puckett, E. H. Price, R. C. Schneider, L. E. Pelletier, Ken Pelletier, Cliff Tomlinson.

Exhibiting: Warm air, hot water, steam and atomizing spray automatic humidifiers and related items; float operated air valves for hot water heating systems; balancing valve adapter units for hot water heating systems; water line float control valves; humidifier valves; water feeders and cut-offs. Balancing valve adapter units for making up balancing valves which, when sweat fitted into a stock copper tee or screwed into an iron tee, completes a balancing valve will be featured. These adjustable balancing adapters, plus the normally stocked tees, make balancing valves for radiators, convectors, radiant coils, mains, etc.

MAMMOTH FURNACE CO., THE, 509 Vandalia St., St. Paul 4, Minn.—Booth S-82

In attendance: Dean C. Rupp, Harold J. Collins, Ralph J. Scheu, Bert Mjolsness.

Exhibiting: Commercial and industrial warm air furnaces, and new "Commercial-Aire" direct fired space heater type furnaces, which will be publicly shown for the first time.

MANVILLE BOILER CO., INC., Stiger St., Hackettstown, N. J.—Booth 440

MARATHON ELECTRIC MFG. CORP., Cherry & Randolph Sts., Wausau, Wis.—Booth S-85

In attendance: R. V. Jones, P. F. Anklam, A. Milhaupt, A. D. Pool, R. P. Salzman, A. W. McCall, P. H. Monaghan, R. M. Pike, C. P. Packard, W. A. Moody, Jr., H. W. Thode, P. H. Walsh, D. E. Baker, F. H. Sturz, J. P. Toto, J. O. Tuohy.

Exhibiting: Electric motors for heating, ventilating and air conditioning; light weight terminal blocks. A new 250 hp explosion-proof motor built in a 680 series frame will be shown for the first time. New oil burner, blower and fan motors will also be featured.

MARIETTA METAL PRODUCTS CORP., Marietta, Pa.—Booth 53

In attendance: John Hancock, Paul Commaker, Russell Burkett.

Exhibiting: Domestic house heating boilers, boiler-burner units, warm air furnaces and warm air units, and oil fired unit heaters.

MARLEY CO., THE, 222 W. Gregory Blvd., Kansas City 14, Mo.—Booth 325

In attendance: L. T. Mart, J. A. Cameron, L. A. Christensen, R. J. Powell, Don Cousins, M. H. McWilliams, R. W. Maze, E. W. Rick, R. M. Sharp, G. D. Truscott, W. V. McCoy, J. P. Ketcham, W. W. Starke, C. A. Smith, W. G. Cramer, H. J. Bierman.

Exhibiting: Packaged steel double-flow water cooling "Aquatower," cutaway model of an "Aquatower," model of double-flow "Aquatower," "AquaCooler." The "AquaCooler," and two of the "Aquatowers" will be shown for the first time.

MARLO COIL CO., 6135 Manchester Ave., St. Louis 10, Mo.—Booths 73-75

In attendance: L. C. Pellegrini, H. R. Iverson, K. W. Wicks, W. B. Moses, J. J. Kramer, F. Ed. Ince, F. G. Meyers, V. Porta, George Flinn.

Exhibiting: Cooling towers, evaporative condensers, central station heating and cooling units, perimeter type remote heating and cooling units, and air cooled condensers. New line of air cooled condensers and several new designs of remote heating and cooling units for hotel, office building and institutional applications will be featured.

MARSH HEATING EQUIPMENT CO., 3501 W. Howard St., Skokie, Ill.—Booth 37

In attendance: James Emmett, Jr., William Ensign, Robert E. Barnett, Don Warner, Harry Kirby, Charles Kelly, Sid Kauffman, Sr., Harold Mitschler.

Exhibiting: Heating specialties, gages, thermometers, needle valves, water regulating valves.

MAXITROL CO., 12200 Beech Rd., Detroit 39, Mich.—Booth 333

In attendance: Frank Kern, Jr., Charles Stang, Jr., Dan J. Tell, Robert T. Hlavin, Herb Schlachter, Don L. Zorn.

Exhibiting: Gas appliance pressure regulators in pipe sizes from ⅛ through 3 in., including products specially suited for use as pilot pressure controls and range regulators. Two new models feature a synthetic rubber seat.

McDONNELL & MILLER, INC., 3500 N. Spaulding Ave., Chicago 18, Ill.—Booth 734

In attendance: E. N. McDonnell, N. W. Swanson, George La Roi, John James, Dick Berry, James Ramsay, Howard Peary, Al Behrens, John Dobise, Merrill Blankin.

Exhibiting: Safety devices for steam and hot water boilers. A new high pressure pump control, low water fuel cutoff and alarm of new design will be displayed for the first time

McQUAY, INC., 1600 Broadway N.E., Minneapolis 13, Minn.—Booth 33

In attendance: Willard B. Buck, Alvin R. Flynn, Frank F. Altman, Wesley H. Markson, Byron James, H. Blake Thomas, Roy J. Resch, Henry B. Williams, Donald P. Wilson.

Exhibiting: Window unit evaporator and condenser coils; residential evaporator coils; steam coils; water coils; direct expansion coils; horizontal unit heater; vertical unit heater; floor, ceiling, "Hideway," and basic type room "Seasonmakers." New air cooled condensers and one and two row booster coils will be introduced.

MERCOID CORP., THE, 4201 W. Belmont Ave., Chicago 41, Ill.—Booth 13

In attendance: Hugh Courteol, J. W. Owens, W. E. Jones, John Shedden, R. F. Fisher, P. J. Provost, W. L. Colterjohn, E. S. Sarson, F. W. Ayer, R. O. Martinsen, V. S. Krale, I. E. McCabe.

Exhibiting: Complete line of sealed mercury contact equipped automatic controls for heating, ventilating, refrigeration and air conditioning, most types being available for indoor, outdoor and hazardous locations.

METALBESTOS DIV., WILLIAM WALLACE CO., P.O. Box 137, Belmont, Calif.—Booth S-88

In attendance: A. L. Hawley, Jr., C. E. Blome, Allen A. Putt, Harry A. Shook, E. C. Whitcomb.

Exhibiting: Round and oval gas vents and flues, assorted lengths of round and oval "Metalbestos" gas vent pipes with fittings. New "WV" oval pipe with new "Fastloc" coupler will be featured.

METALS & CONTROLS CORP., GENERAL PLATE DIV., SPENCER THERMOSTAT DIV., 34 Forest St., Attleboro, Mass.—Booth 50

In attendance: W. Bartlett, L. Burch, L. Comee, J. Cooney, J. Durkee, R. Glidden, C. Gustafson, E. Jastram, E. Kurtz, J. Moorhead, G. Morrison, N. Naylor, F. Ochsner, T. O'Keefe, J. Ottmar, C. Patterson, R. Peck, U. Savolainen, R. Sears, S. Swift, D. Wells, A. White, J. Woodward.

Exhibiting: "Klixon" inherent overheat motor protectors, motor starting relays; "Thermosnap" temperature controls; snap acting hermetically sealed controls; "Klixon" circuit breakers, relief valves; "Truflex" thermostat metal, "Alcuplate" copper clad aluminum composite; "Alnifer" aluminum-nickel-iron composite; "Nifer" nickel iron composite; "Bronco" bronze copper composite; "Bondwich" silver copper nickel composite; newly introduced stainless steel clad copper; electrical contacts.

METROMATIC MFG. CO., 21 Henderson St., Everett 49, Mass.—Booths 121-125

METROPOLITAN REFINING CO., INC., 50-23 23rd St., Long Island City 1, N. Y.—Booth C-38

In attendance: C. M. Sterne, Fred Hodgdon, B. E. Zolit, M. M. Schlissel, H. B. Charak.

Exhibiting: "Vaporene," "DuBoth," "Corrondine," "Sootracide," and "Sludgout."

MID-CONTINENT METAL PRODUCTS CO., 1960 N. Clybourn Ave., Chicago 14, Ill.—Booth 710

In attendance: C. F. Petersen, E. W. Haedike.

Exhibiting: Power gas burners and combination gas-oil burners, featuring a new combination gas-oil burner.

MILLER VALVE CO., INC., 1620 Pennsylvania Ave., Pittsburgh 33, Pa.—Booth 320

In attendance: John R. Miller, T. C. Miller.

Exhibiting: Center-guided, shock-proof check valves. Non-slam check valves that "are silent in operation, eliminate water hammer and can be installed in any position" will be featured.

MILWAUKEE ELECTRIC TOOL CORP., 5316 W. State St., Milwaukee 8, Wis.—Booth C-16

In attendance: G. Heaston, M. Hansen, M. Gleisner.

Exhibiting: Portable electric tools. Demonstrations of the "Sawzall" and "Tri-speed" right angle drills will be featured.

MILWAUKEE GAS SPECIALTY CO., 730 N. Jackson St., Milwaukee 1, Wis.—Booth 444

In attendance: H. E. Toelle, J. H. Thornbery, L. W. Bowerman, D. R. Weidenfeller, S. L. Kile, G. F. Walker, P. S. Brant, E. E. Kriege, P. A. DeLeon.

Exhibiting: New fan control, new limit control, new combination fan and limit control, new room thermostat, and "Baso" automatic pilot valves and switches.

MILWAUKEE VALVE CO., subsidiary of A-P CONTROLS CORP.—see A-P CONTROLS CORP.

MINNEAPOLIS-HONEYWELL REGULATOR CO., 2753 4th Ave., S. Minneapolis 7, Minn.—Booth 103

In attendance: J. E. Haines, J. S. Locke, E. F. Snyder, V. D. Wissmiller, C. W. Proctor, Jr., L. B. Belford, A. H. Koch, Fred Kaiser, H. D. Bissell, K. L. Wilson, Dick Locke, W. W. Martenis, Stan Marshall, K. W. Schick.

Exhibiting: Pneumatic, electric and electronic automatic controls systems for all types of heating, ventilating and air conditioning. An electronic wireless control system "of the future," summer-winter control systems for residential year 'round heating and cooling, and a control system incorporating electronic sensing elements and pneumatically actuated devices will be featured. Among the features of the exhibit will be a new "Schoolmaster" control panel which also provides fire warning through remotely placed fire sensing elements.

MIRROR PATENTED STOVE PIPE CO., 65 Park St., Hartford, Conn.—Booth 721

In attendance: Henry A. Kahn, Robert E. Stone.

Exhibiting: Draft diverters for gas heating appliances, flue pipe and fittings in the following finishes — chromesteel, mirror black enamel, galvanized, and blue finishes.

MITCHELL MFG. CO., 2525 N. Clybourn Ave., Chicago 14, Ill.—Booth 631

In attendance: B. A. Mitchell, H. G. Haas, L. H. Solomon, R. Lodge, M. Kagas.

Exhibiting: Room air conditioners, residential dehumidifiers, commercial and residential packaged air conditioners and year 'round heating and cooling units. All will be shown for the first time. Exclusive "Expando-Mount" on room air conditioners will be featured.

MODINE MFG. CO., 1500 DeKoven St., Racine, Wis.—Booth 934

In attendance: A. G. Dixon, O. E. Desmond, W. R. McMahon, M. J. Druse, A. J. Swartz, W. E. Peirce, H. J. Clark, R. D. Bitzer.

Exhibiting: Steam and hot water unit heaters, gas unit heaters, cabinet units, and convector. "Airditioners" and gas duct furnace will be featured.

MONARCH MFG. WORKS, INC., 2501 E. Ontario St., Philadelphia 34, Pa.—Booth 810

In attendance: T. W. Murphy, E. B. Frame, J. M. Carroll, J. C. Underwood, C. E. Fink, V. B. Kathe, E. S. Gallagher, R. F. Stone.

Exhibiting: Oil burner nozzles, air conditioning sprays and oil burner accessories.

MORRIS SHEET METAL WORKS, 635 W. Mound St., Columbus 23, Ohio—Booth S-78

In attendance: Edward A. Morris, Roy A. Fetterman, Jr.

Exhibiting: Stainless steel cooling towers, fabricated of stainless steel with all brass fittings and bolts, of knock-down construction and with all-heart-redwood filling.

MORRISON PRODUCTS, INC., 16816 Waterloo Rd., Cleveland 10, Ohio—Booth 605

In attendance: Hunter Morrison, Hunter Morrison, Jr., Thompson Morrison, Al Galaba, W. H. Tonner, T. W. Jennens.

Exhibiting: Complete blower assemblies, new direct drive blowers, blower parts for building blower assemblies. A new direct drive blower with 4-way discharge will be featured.

MORRISON STEEL PRODUCTS, INC., 601 Amherst St., Buffalo 7, N. Y.—Booths 140-148

In attendance: S. Morrison, J. Kohnstamm, W. Duffy, A. Ennis, D. Grant, L. Hine, C. O. Rainey, C. Stahlka.

Exhibiting: New sizes, models, colors and capacities of warm air heating and cooling equipment. New counterflow, upflow, lowboy and basement furnaces and horizontal gas and oil furnaces and air conditioning units will be featured.

MORSE-SMITH-MORSE CO., THE, 165 Dexter Ave., Watertown 72, Mass.—Booth S-16

In attendance: Robert P. Johnston, John C. Dieselman.

Exhibiting: "Firomatic" fusible valves, nonfusible valves, tank valves, tank-filter valves, fuel oil filters, fuel oil tank gages, thermal switches, vent caps, fill boxes, fill caps. Tank valves for bottom outlet tanks will be featured.

MORTON ENGINEERING SERVICE, PAUL S., 609 Bangor Rd., Lawrence, Mich.—Booth S-115

In attendance: Paul S. Morton, Mac W. Thomas.

Exhibiting: Btu calculator, area and volume calculator, Btuh calculator, area and crackage calculator, heat loss data and calculation sheet. The Btuh calculator and the area and crackage calculators, as well as the heat loss data and calculation sheet, will be shown for the first time.

MUELLER CLIMATROL, 2005 W. Oklahoma Ave., Milwaukee 15, Wis.—Booths 913-917-921-925

In attendance: H. P. Mueller, F. J. Nunlist, H. P. Mueller, Jr., R. W. Weekes, J. H. Reock, L. A. Miles, H. B. Smith, L. N. Zimmerman.

Exhibiting: Residential and commercial heating and air conditioning equipment, and incinerators. New combination heating and air conditioning unit will be featured.

MULTI-VENT DIV.—see PYLE-NATIONAL CO.

MUNCIE GEAR WORKS, INC., 700 E. Wysor St., Muncie, Ind.—Booth C-14

In attendance: Marvin Smith, D. B. Dell, C. M. Ehrhardt, S. E. Brown, J. P. Connelly, W. F. Fell, John Nevin.

Exhibiting: "Marvair" air conditioning units.

NASH ENGINEERING CO., THE, South Norwalk, Conn.—Booth 400

NATIONAL HEATER CO., INC., 2180 Cleora Ave., St. Paul 4, Minn.—Booth S-10

In attendance: G. T. Costello, S. F. Stewart, A. A. Kosarin, B. A. Kosarin, T. E. Besemer, E. P. Murr, W. M. Kerr, E. M. Tarnoff, H. A. Pietsch, J. J. Heilman, and others.

Exhibiting: New fully assembled, wired, and flame tested light oil fired heater-burner-blower unit and new combination gas and light oil fired change-over model. A cutaway model will be featured.

NATIONAL HEATING PRODUCTS SALES LTD., 4824 Cote des Neiges Rd., Montreal, Que., Canada—Booth S-74

NATIONAL RADIATOR CO., THE, 221 Central Ave., Johnstown, Pa.—Booth 507

In attendance: C. M. Baumgardner, J. W. LeRoy, R. S. Doherty, C. J. Philage, P. J. Bracken, A. K. Tinker, A. J. George, R. K. Bales, A. R. Herske, F. W. Eichler, H. F. Muth, R. M. Reinckens, Joseph Zidalis, C. J. Cusick, M. J. Cianciulli, J. H. Johnston, F. R. Kriebel, L. M. Lyall, W. J. McDougal, G. T. Moran, C. A. Piez, M. M. Taylor.

Exhibiting: Complete line of hot water and steam heating equipment including boilers, heat distributor units and accessories. The "National Packet" — (an "all-in-one" automatic home heating unit and domestic hot water supply), "National Art" baseboard (a heat distributor installed along the outside walls at the living level) and new large residential oil heating unit will be featured.

NATIONAL RADIATOR CO., VIKING AIR CONDITIONING DIV.—see VIKING AIR CONDITIONING DIV.

NELSON DIV., HERMAN, AMERICAN AIR FILTER CO., INC., 215 Central Ave., Louisville 8, Ky.—Booths C-116, C-118

In attendance: Charles S. Stock, John L. Kline, William J. Killian, Irving W. Clark, Frank T. Carroll, John J. Willis, Robert F. DeLay, W. N. Murray.

Exhibiting: Centrifugal fans, unit heaters, propeller fans, and featuring heating and ventilating units.

NESBITT, INC., JOHN J., State Rd. & Rhawn St., Philadelphia 36, Pa.—Booths C-157, C-161, C-165, C-169

In attendance: A. J. Nesbitt, J. J. Nesbitt, Jr., W. D. Widerman, H. B. Hedges, J. J. Merrick, R. B. Sweet, E. W. Wing, Ray Wolf, E. A. Grostas, K. W. Will, M. J. Murray, T. L. Roswell, W. E. Hubbert.

Exhibiting: Unit ventilator equipment for schools, including the "Syncretizer" and "Syncretizer" with "Wind-O-Line"; "Sill-Line" finned radiation (wall hung and with storage cabinets); cabinet type unit heaters; baseboard radiation; heating and cooling surface; air conditioning unit; gas, steam and hot water unit heaters. A new air conditioning unit, new steam distributing tube coil, new cabinet type unit heater, and new series "Wind-O-Line" system for forced hot water heating will be featured.

NEW YORK AIR BRAKE CO.—see AURORA PUMP DIV., HYDRECO DIV., and KINNEY MFG. CO.

NEW YORK BLOWER CO., THE, 3155 S. Shields Ave., Chicago 16, Ill.—Booth 350

In attendance: E. E. Trickler, Bill Mathis, C. J. Trickler, Del Mutimer, John T. Massey.

Exhibiting: Newly designed forward curved and backward curved centrifugal fans.

NIAGARA BLOWER CO., 405 Lexington Ave., Chrysler Bldg., New York, 17, N. Y.—Booths 513-517

In attendance: Paul H. Schoepflin, Ralph C. Knight, H. F. Lowe.

Exhibiting: Air conditioning units, high pressure steam unit heaters, "Aero" heat exchangers, and "No Frost" refrigerating units.

NIAGARA FURNACE DIV., FOREST CITY FOUNDRIES CO., 2500 W. 27th St., CleveLAND 13, Ohio—Booth C-44

In attendance: W. C. Kremser, R. H. Leisenheimer, I. E. Seith, Robert Fritz, Jim Harrison, Frank Walbridge, William Spaine, Otto Zeman.

Exhibiting: Cast iron, gas fired units; steel, gas fired units in highboy, downflow and basement models; oil fired highboy, downflow and basement models.

NIAGARA MACHINE & TOOL WORKS, 637-697 Northland Ave., Buffalo 11, N. Y.—Booths 706-708

In attendance: L. L. Hock, J. S. Selan, J. H. Horton, J. J. Ortalli.

Exhibiting: Sheet metal working tools and machines. Universal power grooving machine which closes single lock seams and also Pittsburgh lock seams will be featured.

NORMAN PRODUCTS CO., 1150 Chesapeake Ave., Columbus, Ohio—Booths 848 & 947

In attendance: E. A. Norman Jr., C. A. Reichelderfer, R. E. Millikan, O. R. Lutz, L. E. Bruce, H. Gallin.

Exhibiting: Horizontal gas fired furnace, residential and industrial gas conversion burners, school room heater, duct heater, unit heater, air conditioning equipment. The school room heater will be featured.

OLSEN MFG. CO., C. A., Filbert St., Elyria, Ohio—Booths 36 & 57

Exhibiting: "Luxaire" combination heating and cooling, year 'round air conditioning units (gas and/or oil fired heating); summer air conditioning units (self-contained, water cooled and air cooled remote types); gas and/or oil fired basement winter air conditioning units; gas and/or oil fired utility and counterflow air conditioning units; gas and oil fired horizontal air conditioning units; gas and/or oil fired gravity furnaces; gas fired unit heaters; gas conversion burners; oil conversion burners; blower-filter units; gas incinerators; and "Moncrief Surefit" warm air duct fittings and registers. New air conditioning units of 2, 3 and 5 ton capacity, newly styled gas fired unit heaters, and two new large capacity oil fired horizontal units with outputs of 220,000 and 400,000 Btu per hr will be featured.

ORR & SEMBOWER, INC., Morgantown Rd., Reading, Pa.—Booth 800

In attendance: S. D. Distelhorst, R. C. Gray.

A. J. Szynkiewicz, L. A. Roethe, R. C. Currie, W. P. Williams, J. Darlington.

Exhibiting: "Powermaster" packaged automatic boiler. "Voriflow" fuel burning system. "Autolec" electric boiler.

OWENS-CORNING FIBERGLAS CORP., National Bank Bldg., Toledo 1, Ohio—Booth S-42

In attendance: R. W. Farris, R. C. Brower, W. S. Haynes, W. A. Stutts, R. J. Littin, W. F. Condon, W. E. England, H. E. Renz.

Exhibiting: Molded insulation, "Fiberglas" gasket material, "Dust-Stop" filters, duct insulation, "Fiberglas" pipe insulation, furnace insulation, "Fiberglas" reinforced plastics for air conditioning units. Molded insulation and gasket and vibration dampening material will be featured.

PACIFIC STEEL BOILER DIV., UNITED STATES RADIATOR CORP., 439 Penobscot Bldg., Detroit 26, Mich.—Booth 30

In attendance: Howard B. Steggall, Edmund J. Grady, E. F. Hackett, D. E. Welsh, J. A. Hallinan.

Exhibiting: Steel heating boiler, steam heating equipment, hot water heating equipment, and general heating equipment. A new application of oil burning with a "Pacific" boiler will be featured.

PARAGON ELECTRIC CO., 1600 Twelfth st., Two Rivers, Wis.—Booths 717-719

In attendance: W. A. Petersen, R. V. Mitchell, T. P. Casey, J. Neill.

Exhibiting: Time controls.

PATTEN CO., J. V., 550 DeKalb Ave., Sycamore, Ill.—Booth 110

In attendance: A. A. Boyle, E. H. Lambert, Shepard Herman, L. R. Williams, Wm. Webster, Wm. Millison, Wallace Landau, S. R. Roberts, Don C. Patten, John H. Patten, S. F. Gitterman.

Exhibiting: Oil fired and gas fired "Sun Fuel-Master" furnaces, lo-boys, hiboys, (upflow and downflow), suspended furnaces. Combination heating and cooling units. Air cooled and water cooled cooling units. New line of combination heating-cooling equipment, and new line of oil or gas fired residential furnaces will be featured.

PATTERSON-KELLEY CO., INC., THE, 105 Warren St., East Stroudsburg, Pa.—Booth 909

PEERLESS ELECTRIC CO., THE, 1401 W. Market St., Warren, Ohio—Booth 410

In attendance: Walter A. Curtis, Lester C. Mills, R. E. Lininger, R. D. McCallum, A. O. Osborn.

Exhibiting: Fans and blowers, featuring new backward curve blower.

PEERLESS PUMP DIV., FOOD MACHINERY AND CHEMICAL CORP., 2005 Northwestern Ave., Indianapolis, Ind.—Booth 723

In attendance: Harold Franz, Edward W. Karpinski, Frank W. McCann, Carl L. Nickel.

Exhibiting: End suction pumps.

PEERLESS SALES DIV., 1611 Main St., Little Rock, Ark.—Booths S-41 and S-2

In attendance: R. D. Elgin, R. R. Pabodie, J. W. Creagh.

Exhibiting: Induced draft cooling towers, featuring residential models.

PENN BOILER AND BURNER MFG. CORP., Fruitville Rd., Lancaster, Pa.—Booth C-115

In attendance: Richard W. Payton, C. M. Lane, D. A. Esslinger.

Exhibiting: "Air-Rad," boilers, chiller units and year 'round comfort conditioning. A new water chiller and a new year 'round comfort conditioning unit will be featured.

PENN CONTROLS, INC., Goshen, Ind.—Booth 23

In attendance: R. S. Penn, E. B. Maire, R. H. Luscombe, K. W. Cash, R. V. Clark, J. Searls, Paul Penn, R. L. Ratliff, Carlos Morgan, Emile Tassin, Cap Barr, Jim Garrett, George Sander, Robert Eichman, Bill Kase, Ed Corbett, Boyd Ralph, Frank Fessler, Jim Kinney, Ivan Stepnich, Harold King, Howard Shilling, Jud Forbes, Dave Belknap.

Exhibiting: Controls for gas, oil and coal heating and residential and commercial cooling. Combination heating-cooling residential air conditioning thermostat, and compact control centers for residential and self contained air conditioning systems, will be featured.

PENNSYLVANIA FURNACE AND IRON CO., 316 Pine St., Warren, Pa.—Booth 806

In attendance: Roy L. Blodgett, Horace J. Harvey, Christian S. Andersen.

Exhibiting: Gas fired boilers, winter air conditioning furnaces, gravity furnaces, floor furnaces, conversion burners, air conditioning cooling units. The furnaces, conversion burners and cooling units are new models recently approved by the AGA.

PERFECTION STOVE CO., 7609 Platt Ave., Cleveland, Ohio—Booths 18 and 38

In attendance: D. S. Smith, J. H. Rasmussen, Marc Resek, L. Bushfield, M. A. Miller, A. S. Bergschneider, M. H. Crist, H. W. Dean, C. A. Moore, H. C. Erikson, Harold Kiefer, G. A. Crowner, W. M. Potter, T. W. Russell, W. R. Wright, J. W. Shrank, R. S. Cadwallader, W. C. Meredith, S. C. Reese, A. B. MacLaren, W. S. Degarimore, Mrs. Alice Holton, W. J. Wilk, Joe Johnston, Howard Chew, Joe Giannone.

Exhibiting: Warm air furnaces and cooling units.

PERFEX CORP., 500 W. Oklahoma, Milwaukee 7, Wis.—Booth 532

In attendance: T. A. Ramey, M. Eastin, R. Horan, I. G. Bohrman, E. Panthover, K. Watts, J. McGuire, M. Bowman, E. Spall.

Exhibiting: Coils for refrigeration and air conditioning; automatic controls for heating, ventilating, air conditioning.

PETRO, 3170 W. 106th St., Cleveland 11, Ohio—Booth 2

In attendance: C. E. Bailey, W. J. Hegan, G. A. Moore, J. E. O'Donnell, G. H. Martinik, A. G. Barry, L. V. Moore.

Exhibiting: Gun type oil burners, water heater, lowboy oil furnace, horizontal duct furnace, rotary industrial oil burner.

PHILLIPS DRILL CO., Michigan City, Ind.—Booth S-64

In attendance: J. L. Campbell, J. J. Kerwin, Bob Bowman, Bob Williams, Archie M. Pine, Howard C. O'Brien, J. M. Warnimont, Arnold W. Barnett, Wm. A. Benner.

Exhibiting: Expansion bolts (anchor bolts), featuring actual demonstrations.

PITTSBURGH PLATE GLASS CO., 1 Gateway Center, Pittsburgh 22, Pa.—Booth 748

In attendance: R. A. McLaughlin, R. R. Pryor, C. W. Olsen, A. W. Stevenson, W. E. Grasberger, H. J. Bygott, Jr.

Exhibiting: Fiber glass "Superfine" duct insulation will be featured and "Glasfloss" air filters will be shown.

PITZ FOUNDRY, INC.—see AMERICAN HYDROVAC

PLUMBING & HEATING BUSINESS, 130 E. 59th St., New York 22, N. Y.—Booth C-65

Exhibiting: Publication

PLUMBING, HEATING, AIR CONDITIONING WHOLESALER, 92 Martling Ave., Tarrytown, N. Y.—Booth C-18

Exhibition: Publication

POWERS REGULATOR CO., 3400 Oakton St., Skokie, Ill.—Booths 433, 435

In attendance: J. W. Powers, F. A. Murray, D. L. Ladd, K. M. Stevens, E. R. Bowman, C. A. Gustafson, D. A. Stott, W. E. Williams, D. A. MacWatt, E. K. Wagner, G. E. Fickett, C. P. Krantz, R. M. Spencer, M. W. Jones, C. J. Bootes, I. H. Dale, W. I. Collier, M. E. Weninger, R. E. DeWallace, M. E. Waddell.

Exhibiting: Complete line of temperature, pressure, and humidity controls. An improved series of water controllers will be featured.

PRAT-DANIEL CORP.—see THERMOBLOC DIV.

PREFERRED UTILITIES MFG. CORP., 1860 Broadway, New York 23, N.Y.—Booth 850

In attendance: R. S. Bohn, W. H. Bohn, R. G. Bohn, J. S. Kaplan, J. R. Arden, A. O. Swensen.

Exhibiting: Unit steam generator, horizontal oil fired rotary burner, horizontal combination gas and oil fired rotary burner, "Thermopak," commercial and industrial oil burning specialties, pump and heater set and pipe line and oil storage tank heating systems. "Thermopak" will be featured.

PREMIER CO., 755 Woodlawn Ave., St. Paul 1, Minn.—Booth S-126

PRIMOR PRODUCTS, INC., 2011 W. Beecher Rd., Adrian, Mich.—Booth S-21

In attendance: R. M. Herbert, T. H. Smoot, J. H. Parsons.

Exhibiting: Air conditioning units for central residential application, direct expansion systems, water chiller systems, water cooled and air cooled systems, hermetic and remote coil systems, vertical and horizontal units.

PULLMAN VACUUM CLEANER CORP., 33 Allerton St., Boston 19, Mass.—Booth 429

In attendance: Edgar A. Green, Norman Ruby, Alex McCall, Harold Goodwin, Robert Berns.

Exhibiting: Furnace and boiler vacuum cleaner.

PYLE-NATIONAL CO., THE, 1334 N. Kostner Ave., Chicago 51, Ill.—Booth C-21

In attendance: George K. Raider, Robert Geocaris, Edmund Kurek, Robert Arnold, Chet Rhea, Otto Bochat.

Exhibiting: "Multi-Vent" air diffusers for heating, ventilating and air conditioning, featuring radiant panel in combination with air diffuser, and high pressure, high velocity convertor for high velocity systems to proportion air as required.

QUICKDRAFT CO., 1150 S. Erie Blvd., Hamilton, Ohio—Booth S-77

In attendance: Alan P. Russell, John Akins, Jr., Arthur Fox, Jr., Howard C. Edwards.

Exhibiting: Standard and heavy duty draft induction equipment, switches and accessories. An animated display showing the equipment in operation in a typical automatic oil fired heating system will be featured.

QUIET HEET MFG. CORP. and QUIET KOOL CORP., sub. of EMERSON RADIO & PHONO. CORP., 46 Oliver St., Newark 5, N.J.—Booth 803

In attendance: J. D. Small, J. Longin, B. Sachs, M. Beline, P. Komroff, H. M. Spitzer, S. L. Sloan, W. A. Gamble, L. Pacent.

Exhibiting: Oil burners, gas burners, sump pumps, room air conditioners, central residential air conditioners, and commercial air conditioners, featuring new 1955 line.

QUINCY STOVE MFG. CO., THE, 825 Front St., Quincy, Ill.—Booths S-51, S-53

In attendance: Herman D. Tow, H. L. Hudson, A. L. Swartzmiller, J. L. Parsons.

Exhibiting: "Monogram In-the-Wall" oil furnace and gas furnace; and recessed oil wall heater, which will be featured with a special modulating type thermostat.

RADIANT-RAY RADIATION, INC., 464 Hartford Ave., Newington, Conn.—Booth 310

In attendance: W. R. Becher, F. W. Becher, M. F. Becher, D. W. Erickson, E. C. Jackson, C. C. Cartwright, E. O. Davis.

Exhibiting: Baseboard radiation, "Airfoil" finned radiation and "Custom-Fit" enclosures, and "Radiant-Rayvector" wall radiation. New seamless copper tube with aluminum fins in large nominal sizes will be featured.

RADIANT UTILITIES CORP., 8817 18th Ave., Brooklyn 14, N. Y.—Booth 217

In attendance: Arthur A. Marcus, Joseph Bloom, Julius S. Goldberg, Jacob G. Goldberg.

Exhibiting: High pressure oil burners, sump pumps, submersible sump pumps, utility pumps, furnaces. A new low pressure oil burner will be featured.

RADIO CORP. OF AMERICA, ENGINEERING PRODUCTS DIV., Camden 2, N. J.—Booths S-84 & S-86

RALPH MFG. CO., P.O. Box 118, Wadsworth, Ohio—Booths 622-624

RANDALL GRAPHITE BEARINGS, INC., Greenlawn & Lake Sts., Lima, Ohio—Booth 65

In attendance: W. E. Dickerson, K. W. Strunk, C. W. Esch, Ray Chaney, E. Dorsey, H. C. Peterson.

Exhibiting: Bearings; self-aligning, self-lubricating graphited bronze pillow blocks; ball assemblies; safety collars; thrust washers; flange units; bearing brackets. Flange units, bearing brackets, and plastic lubrication will be featured.

RCS TOOL SALES CORP., 200 Moen Ave., Joliet, Ill.—Booth 339

In attendance: Thos. M. Sweeney, James A. Kinsella, George E. Schultz.

Exhibiting: "Super Saw" portable all-purpose power saw for roughing-in work, blades, and "Korner King" right angle drill attachment. New chrome alloy roughing-in blades will be featured.

REDMOND CO., INC., Owosso, Mich.—Booth 608

REFLECTAL CORP., (subsidiary, BORG-WARNER CORP.), 310 S. Michigan Ave., Chicago 4, Ill.—Booth 326

In attendance: R. E. Duncan, J. R. Frank, G. E. Johnson, A. R. Whitlock, R. F. Ballou.

Exhibiting: "Alfol" reflective insulation, "Koolshade" sunscreen.

REFRIGERATION & AIR CONDITIONING CONTRACTORS ASSOCIATION, 228 N. LaSalle St., Chicago 1, Ill.—Booth 100

REMINGTON ARMS CO., INC., 939 Barnum Ave., Bridgeport 2, Conn.—Booth 808

In attendance: J. C. MacIntyre, Townsend Wheeler, C. J. Turner.

Exhibiting: "Stud Driver" powder actuated fastening tool. New studs approved by Underwriters' Laboratories and Factory Mutual Laboratories for hanging sprinkler pipe up to and including 2 in. diameter, and an approved ¼-⅜ in. coupling for hanging standard hanger rods, will be featured.

REPUBLIC PRODUCTS CO., 7426 State Rd., Philadelphia 36, Pa.—Booth S-57

In attendance: W. H. Bunten, Ray Donnoly, Mr. Spencer.

Exhibiting: "Repco Thriftmaster" tubeless boilers, gas and oil; baseboard radiation; convector radiation; "Aire Trim" baseboard (forced warm air); winter air conditioners (forced warm air) high and low boys; "V.T." tube boiler, oil fired.

RESEARCH PRODUCTS CORP., 1015 E. Washington Ave., Madison 10, Wis.—Booth 448

In attendance: A. W. Brown, J. G. Schultz, C. B. Rowe, P. N. Dutton, C. H. Soderberg.

Exhibiting: "RP E Z Kleen" air filters, "RP Alumaloy" industrial air filters, "RP" paint arrestors, and "RP Aprilaire." New humidifier will be featured.

RHEEM MFG. CO., 7600 S. Kedzie, Chicago 29, Ill.—Booth 301

In attendance: Paul Fetzek, A. F. Cassidy, Runo Anderson.

Exhibiting: "Year 'Rounder" combination heating and cooling; gas and oil fired forced air furnaces; room air conditioner; and remote air cooled cooling unit.

RICHMOND ENGINEERING CO., INC., 7th and Hospital Sts., Richmond, Va.—Booth S-68

In attendance: Owen W. Conley, Vaughan E. Calder, Jr., James K. Baird, Thomas C. McCarthy, Paul Hickman, Jack S. Lough, T. R. Sullivan, E. Starke Farley.

Exhibiting: Hot water heating coils, instantaneous heaters, hot water convertors, hot water storage heaters and other related heat exchange equipment.

RICHMOND RADIATOR CO., 16 Pearl St., Metuchen, N. J.—Booth 831

In attendance: E. Reichert, V. Sherman, J. J. Hall, C. T. Sullivan, R. Somers, L. Maehling, H. Zeamer, D. D. Conover, C. E. Stoner, I. Lininger.

Exhibiting: Gas fired and oil fired units, cast iron and steel winter air conditioners, cast iron boilers, horizontal furnaces, gravity furnaces, cooling units, other types of automatic heating equipment.

RIC-WIL, INC., 24 Brown St., Barberton, Ohio —Booth 606

Exhibiting: Insulated pipe units.

RIDGE TOOL CO., THE, Elyria, Ohio—Booths S-44, S-79

In attendance: William L. Parcell, L. C. Richardson, Milo Sharp, Mike Fried, Carl Petersen.

Exhibiting: Pipe and bolt threading machine.

RITTLING CORP., THE, 831 Rand Bldg., Buffalo 3, N. Y.—Booth S-7

In attendance: J. B. Rittling, R. W. Rittling, R. J. Carter, D. F. Moran, Fred Thompson, Frank Helikson, Paul Fisher, Thos. Olesko, Millard Roberts, N. T. O'Rourke, J. W. Swanson, Oliver Holmes, Geo. Washington, Jr., Welby Rouse, Walter Strickland, Norman Conlon, Paul Thompson, Court Ahrens, Carlton Ferris, Chas. LeFevre.

Exhibiting: Pre-fab baseboard, "Sil" type radiator, "Silent" back draft damper, cabinet convectors, unit heaters, finned tube. The prefab baseboard and the back draft damper are new products.

ROBERTS-GORDON APPLIANCE CORP., 44 Central Ave., Buffalo 6, N. Y.—Booths 607-609

In attendance: W. S. Gordon, Jr., L. C. Smyth, R. I. Warnecke, W. E. Davis, J. W. Crim, R. T. Huyck, Edw. Neuman, R. G. Budden, William Sterling, Glenn Sterling, Herbert Vom Scheidt.

Exhibiting: Gas conversion burners, gas boilers, gas furnaces, gas unit heaters, gas-oil conversion burners. New hi-boy furnaces and lo-boy furnaces will be featured.

ROBERTSHAW FULTON CONTROLS CO.—see FULTON SYLPHON DIV.

ROCKWELL SPRING AND AXLE CO.—see TIMKEN SILENT AUTOMATIC DIV.

ROME-TURNEY RADIATOR CO., 109 Canal St., Rome, N. Y.—Booth 741

In attendance: William L. Lynch, John J. Boylan, Edwin J. Parry, E. L. A. Forster, Joseph M. Shannon, Francis M. Larkin, Thomas Murphy, Donald McKay.

Exhibiting: Convector radiators and baseboard radiation.

ROTH CO., ROY E., 2420 4th Ave., Rock Island, Ill.—Booth S-1

In attendance: Roy E. Roth, Paul M. Roth, Arthur Reed, Robert Kress, Woodward Smith.

Exhibiting: Two-stage power plant pumps, regenerative turbine pumps, featuring low pressure stuffing boxes and balanced shaft loading.

RUSSELL CO., THE F. C., 1100 Chester Ave., Cleveland 1, Ohio—Booth 817

In attendance: P. McCormick, D. Black, B. Robertson, C. Ayers, H. Raymor, T. Maloney, F. Smith, L. Mucci, T. Sherry.

Exhibiting: "Rusco Picture-Windo" combination screen and storm door, 3-in-1 "Windo-Door", screen door, "Californian" porch enclosure, combination self-storing screen and storm sash, "Challenger" window S.S., casement insulating sash (hinged and horizontal slide), glass-louver jalousie window, glass-louver jalousie door, "Challenger" awning.

SARCO CO., INC. and SARCOTHERM CONTROLS, INC., 350 Fifth Ave., New York 1, N. Y.—Booth 213

In attendance: L. Barfus, R. W. Cumming, P. E. Girardet, M. J. Marion, T. R. Stevens, R. H. Tuffield.

Exhibiting: Heating specialties, steam traps, temperature regulators, hot water specialties, controls for both hot water and steam heating systems.

SCHECTER BROS. CO., N. W. Cor. Hancock & Huntingdon Sts., Philadelphia 33, Pa.—Booth S-91

In attendance: Samuel Schecter, Morris Gross, Morris T. Ehrenfeld, Isadore Yasno, Francis McCusker, John Cascio.

Exhibiting: Galvanized prefabricated duct, fittings, furnace pipe and elbows.

SCULLY SIGNAL CO., 174 Green St., Melrose 76, Mass.—Booth 833

SEQUOIA MFG. CO., 1000 Brittan Ave., San Carlos, Calif.—Booth C-39

In attendance: Glenn Barnes, Arthur Theobald.

Exhibiting: Forced air heating and air conditioning units. New model of "Closet'eer" type forced air residential air conditioning units will be featured.

SERVEL, INC. (AIR CONDITIONING DIV.), Evansville 20, Ind.—Booths 807-809

In attendance: Ken R. Mott, C. A. Gruggel, J. O. Yund, R. L. Brown, G. O. Galloway, R. C. Marbach, H. R. Nielsen, W. J. Hoeing, J. T. Mooney.

Exhibiting: 25 ton absorption water chiller, 5 ton absorption refrigeration unit, 2 ton "All-Year" air conditioning unit, new electric 3 ton air conditioner, 3 and 5 hp "Supermetic" compressors, smaller compressors. A ½ ton glass model of an absorption system will be shown in operation.

SHAFER CO., MARVIN D., 2464 Fletcher Dr., Los Angeles 39, Calif.—Booth C-55

In attendance: Marvin D. Shafer.

Exhibiting: "Donaldson" power roof ventilator, wall mounted ventilator; "Adams" 34,000 Btu counterflow furnace especially designed for use in house trailers or small apartments.

SHANA MFG., INC., 188 W. Randolph St., Chicago, Ill.—Booth S-46

In attendance: Harry Shaffer, Morton Simon, Jack Miller.

Exhibiting: Water cooled 2, 3 and 5 ton air conditioning units; air cooled 2. 3 and 5 ton units; and featuring 1½ ton air cooled unit; and combination air or water cooled units with oil or gas fired furnaces.

SIEMON MFG. CO., Grandview (Suburb) Kansas City, Mo.—Booth C-61

In attendance: R. W. Brown, Paul Lunkwicz, M J Murray.

Exhibiting: New "Power-Flame" gun type gas burners and "Power Combi-Matic" gas-oil Burners.

SIMPLAIRE, 521 Fifth Ave., New York 17, N. Y.—Booth C-154

In attendance: Don J. Ferraro

Exhibiting: "Spot Cooling" air conditioner.

SKUTTLE MFG. CO., Milford, Mich.—Booth S-58

In attendance: R. W. Geisler, K. M. Fournier, C. J. Theobald, J. W. Faulkner, G. J. Selby, William Debler, Sr., William Davis, Walter Stamberger, Jr., V. E. Devine, T. C. French, Wayne Gift, Wendell Franks.

Exhibiting: Humidifiers, featuring model 250 independently controlled and operated humidifier.

SLANT-FIN RADIATOR CORP., 87-49 130th St., Richmond Hill 18, N. Y.—Booth S-125

In attendance: Alvin Buschel, Milton M. Brooks, Melvin Dubin, Les Ogrin, Arthur Appelbaum, Sidney Groves, Irving Turninsky, Jack Marcus.

Exhibiting: "Slant-Fin" commercial finned tube radiators and residential baseboard radiators, and new "Square-Fin" commercial finned tube radiators and residential baseboard radiators. Also "Slant-Fin" finned evaporators for refrigeration. New types of enclosures will also be shown.

SMITH CORP., A. O., 3533 N. 27 St., Milwaukee, Wis.—Booth 714

In attendance: C. L. Hewitt, J. S. Robinson, D. V. Coon, S. E. Wolkenheim, K. E. Lofgren, W. A. Dunn, H. S. English, R. L. Fisk, C. W. Schulz, P. P. Toth, Ken O'Gorman, J. A. Needham, D. S. Shafer, T. M. Williamson W. T. Halket, J. E. Akehurst, R. B. Chace, R. N. Clark, J. H. Harrigan, G. E. Hubler, J. V. Pepin, H. N. Johnson, S. J. Burbank, W. B. Furlong, C. W. Johnson, J. S. McCollough, J. H. Trimble, W. F. Manthei, A. H. Schlueter.

Exhibiting: Year 'round air conditioners, oil and gas fired furnaces, gas fired home heating boilers, gas conversion burners.

SMITH EQUIPMENT & SUPPLY CO., 1615 N. Central Ave., Chicago 39, Ill.—Booth S-120

SMITH CO., INC., H. B., 57 Main St., Westfield, Mass.—Booth 321

In attendance: John E. Reed, T. C. O'Connor, Leo Sudhaus, Guy Smith, Trevor Jackson, John J. Poyatt, E. J. Webber.

Exhibiting: New "Smith Century" gas boiler; "Mills" cast iron sectional boiler for larger buildings.

SNIPS, 5707 W. Lake St., Chicago 44, Ill.—Booth 135

SPARKLER MFG. CO., 169 Lake St., Mundelein, Ill.—Booth S-26

In attendance: Richard J. Stastny, John B. Anderson.

Exhibiting: Fuel oil filters.

SPENCER HEATER, LYCOMING DIV., AVCO MFG. CORP., 652 Oliver St., Williamsport, Pa.—Booth 129

In attendance: E. I. Boardman, R. R. Adams, C. W. Shaffer, K. E. Schooley, C. R. Miller, L. G. Gorman, E. L. Mahl, M. D. Vicchiarelli, D. Reinhardsen, H. A. Marchione, H. H. Cammann, Jr., N. M. Cott, R. F. Fagan, H. A. Johnson, C. K. Dennis, C. L. Bowman, C. T. Montgomery, E. A. MacDonald, Greene Hogg.

Exhibiting: Divided low waterline boiler, residential steel heating boilers, "Suburban" oil burner-boiler package unit, and featuring "Rancher" gas burner-boiler unit.

SPENCER THERMOSTAT DIV.—see METALS & CONTROLS CORP.

SPI-ROL-FIN CORP., 133 Greenwood Ave., Pequannock, N. J.—Booth S-111

In attendance: F. R. Attwood, J. E. McGinnis, D. D. Attwood, F. Harbin, P. Orr, N. J. Driscoll, M. Portnoy, S. Schwartz.

Exhibiting: Baseboard radiation, steel fin industrial radiation, and domestic water coils, featuring new line of commercial radiation, new stainless steel baseboard cover, and new patented roller hanger for steel fin radiation.

SPORLAN VALVE CO., 7525 Sussex Ave., St. Louis 17, Mo.—Booth 729

In attendance: C. C. Grote, W. H. Krack, D. B. Rentschler, W. A. Reichenbach, T. H. Silary, F. C. Hawco.

Exhibiting: Thermostatic expansion valves, refrigerant distributors, solenoid valves, "Catch-All" filter-driers. An air conditioning coil with a refrigerant distributor, thermostatic expansion valve and filter-drier installed thereon will be featured.

SPRAGUE ELECTRIC CO., Marshall St., North Adams, Mass.—Booth S-93

In attendance: Neal W. Welch, Carrol Killen, Sidney L. Chertok, John G. Brent, James Galbraith, William M. Allison, Anthony Ruscito, Wilmer S. Trinkle, Charles H. Wacker, Charles Janton, Leon Podolsky.

Exhibiting: Capacitors, resistors, and radio noise filters. New rectangular drawn-case "Clorinol" capacitors for power factor correction of large air conditioners will be featured.

SQUARE D CO., 4041 N. Richards, Milwaukee 11, Wis.—Booth S-94

In attendance: W. E. Helle, J. B. Schifflin, T. P. D'Amour, C. R. Whitney, S. A. Johnson.

Exhibiting: Electric motor control—magnetic starters and pump control. New line of magnetic starters, and tank float switches in actual operation will be featured.

STANDARD STAMPING & PERFORATING CO., 3131 W. 49th Pl., Chicago 32, Ill.—Booth 344

In attendance: Wm. Ramquist, Lloyd Stone, Andrew Lavela.

Exhibiting: Registers and grilles.

STEEL PRODUCTS ENGINEERING CO.—see COMBUSTIONEER DIV.

STEPHENS-ADAMSON MFG. CO., Ridgeway Ave., Aurora, Ill.—Booth C-41

In attendance: Richard Glavan, Carl F. King, George Marsh.

Exhibiting: "Sealmaster" ball bearing units. Rubber mounted bearing units will be featured.

STEWART MFG. CO., INC., Grove Ave., Cedar Grove, N. J.—Booth 840

STEWART-WARNER CORP., U. S. MACHINE DIV., 320 North C St., Lebanon, Ind.—Booths 111 and 113

In attendance: Claude A. Potts, Walter E. Blake, Robert C. Hulse, Ray F. DeVaney, Walter R. Leander, and 10 "Winkler" district sales managers.

Exhibiting: "Winkler" oil burners, gas burners, oil furnaces, gas furnaces, gas water heaters, central air conditioning units; "Saf-Aire" gas wall heaters; recessed wall heaters for oil or gas. Vertical and counterflow furnaces for oil or gas and steel and cast iron boilers for oil will be featured.

STRONG, CARLISLE & HAMMOND CO., 1392 W. Third St., Cleveland 13, Ohio—Booth C-23

In attendance: R. L. Clark, H. H. Maltbie, W. O. Clark, Ed Buckholtz.

Exhibiting: Steam traps, pressure reducing valves, strainers, separators, vacuum traps, pumping traps, continuous blowdown valves, engine stops for overspeed protection. New "Hydro-flex" inverted bucket steam traps "for any pressure or temperature" will be featured.

STURTEVANT DIV.—see WESTINGHOUSE ELECTRIC CORP.

SUNBEAM AIR CONDITIONER DIV., AMERICAN RADIATOR & STANDARD SANITARY CORP., Elyria, Ohio—Booth 20

In attendance: T. W. McNeill, W. H. Baker, Jr., R. J. Berkshire, W. G. Senft, A. D. Sullivan, H. F. Rossell, Jr., W. W. Woodroof, R. H. Shine, C. M. Hoover, W. W. Follett, R. D. Kishbauch, W. L. Bradshaw, J. P. Farrell, W. J. Sullivan, W. D. Campbell, J. B. Mitchell, P. S. Agey.

Exhibiting: 3 hp commercial air conditioner; 2 hp residential air conditioner (with blower); new 2 hp horizontal air conditioner; new 2 hp residential air conditioner (add-on); counterflow gas winter air conditioner; new utility gas winter air conditioner; new basement gas winter air conditioner; utility oil winter air conditioner; new basement oil winter air conditioner; "Magne-filter" electrostatic air cleaner.

SUNDSTRAND ENGINEERING CO., 1325 Seventh St., Rockford, Ill.—Booth 818

In attendance: R. H. Gustafson, M. M. Miller.

Exhibiting: High pressure and low pressure domestic oil burners, and small commercial-industrial type oil burners.

SUNDSTRAND MACHINE TOOL CO., HYDRAULIC DIV., 11th St., Rockford, Ill.—Booth 231

In attendance: B. F. Olson, L. H. Schuette, A. H. Swenson, C. W. Lang, Floyd Carlson, L. T. Stoyke, Lou Dolan, R. W. Erikson, Pere Levin, B. L. Soderberg, W. R. Kiefer, R. E. Stevens, O. E. Mayfield, J. F. Griffey, B. L. Douglas, S. Ferraro.

Exhibiting: Fuel units (operating): model J showing single-stage plastic construction, model H two-stage, model AT air-oil fuel unit. New air-oil low pressure fuel unit under simulated fire will be featured.

SUN-RAY BURNER MFG. CORP., 139-24 Queens Blvd., Jamaica, N. Y.—Booth 139

In attendance: Alfred Metzger, Gabe M. Marin, Alfred Luft, Robert Adcock, Hugh Mallard, Martin Sones, Jack Maxwell, Henry Nickerson, Burt B. Vickery, Emmons Nickerson, F. W. Sieffert, Meyer Bressen, Wm. Oliver, Herbert Fowler, John Brecht, Bernard A. Thomas & Partner, R. P. Jones, Marvin Handler.

Exhibiting: Domestic and commercial oil burners (horizontal and vertical). New improved vertical flame burner, the "Bantam," with "minimum dimensions, maximum quality," will be featured. Live exhibit will show burners under fire.

SURFACE COMBUSTION CORP.—see JANITROL HEATING & AIR CONDITIONING DIV.

SYNCHRONOUS FLAME, INC., North Main St., Walworth, Wisc.—Booth S-39

In attendance: Charles E. Stevens, Jr., Charles T. Monroe.

Exhibiting: Combination gas-oil burners, power gas burners, industrial light oil burners. A live exhibit will show a dual fuel burner in operation.

SYNCHROMATIC CORP., 1141 10th St., Watertown, Wis.—Booth 29

In attendance: H. M. Stillman, George Day, Leonard Troeller.

Exhibiting: "Hi-cap" oil or gas furnace, "Hi-cap'' suspended unit, ''Lo Boy'' oil fired, ''Lo boy'' gas fired, oil or gas ''Lo boy'' oil or gas counterflow.

TACO HEATERS, INC., 1160 Cranston St., Cranston 9, R. I.—Booth 518

In attendance: J. Balter, R. H. Chaffee, W. P. Klein, W. T. Robinson, H. E. Lucas, E. Pollenz, C. Sliney, W. Sliney, H. Lisowski, W. P. Haney, E. W. Leonard, R. Sumpt, E. J. Conley, R. J. Tesar, W. E. Johnson.

Exhibiting: Heat exchangers, chillers, water circulating pumps and hot water heating specialties. New universal ''Flochek'' suitable for angle or horizontal application will be featured.

TANN CORP.—see CONGRESS DRIVES DIV.

TECUMSEH PRODUCTS CO., Tecumseh, Mich.—Booth 62

In attendance: M. A. Shantz, H. L. Bargeman, R. B. Grisbrook, L. J. Freitas, F. F. Kennedy, J. E. Parker, G. I. Boone, G. B. Boone, J. A. Swain, R. T. Smith, J. E. Smith, R. C. Hiatt, L. W. Larsen, F. G. Purcell, C. M. Brown, D. J. Bowen, P. G. Colgrove, H. M. Kelso, A. S. Russell, W. W. Higham, E. D. Halsey, T. S. Pendergast.

Exhibiting: Air and air-water cooled compressors for year around central station air conditioning, 1 to 3 hp; ¾ hp plastic operating compressor for room coolers: new 2 and 3 hp remote commercial condensing units. The 1, 1½, 2 and 3 hp compressors for air cooled applications will be featured.

TEMCO, INC., 4104 Park Ave., Nashville 9, Tenn.—Booth 814

In attendance: William H. Ferriss, Cecil B. Oakley, Lee W. Rasch, F. Donald Hart.

Exhibiting: Gas fired central heating and air conditioning equipment (Hi-boy's, lo-boy's, gravity furnaces, horizontals and counter-flow furnaces); air conditioning units (2 to 5 ton capacity); gas wall heaters: gas floor furnaces; gas space heaters.

THATCHER FURNACE CO., Center St., Garwood, N. J.—Booth 508

In attendance: R. Cook, M. Beard, S. Leigh, I. Vail, G. Fleming, R. Eyers, J. Sheehan.

Exhibiting: Oil and gas fired units and summer cooling equipment, featuring ''double duty'' oil or gas fired winter air conditioner.

THERMOBLOC DIV., PRAT-DANIEL CORP., 2 Meadow St., South Norwalk, Conn.—Booth C-166

In attendance: Edward P. Pearsall, Richard F. Sharon, Conrad H. Pinches, Joseph Kirkbride, Harold Parent.

Exhibiting: ''Thermobloc'' direct fired warm air heaters, ''Aerotec Deep Heet'' generator (a new product), ''Panelbloc'' (formerly known as ''Panelroy'') radiant gas fired infra-red heaters.

THERM-O-WHEEL, INC., 1040 B. 22 St., Far Rockaway, N. Y.—Booth S-102

In attendance: Nathan Wolpov, Abraham Heckman, Harry N. Crowell.

Exhibiting: A demonstration of the application of the ''Therm-O-Wheel'' for heat recovery within the exposition building will be featured, and demonstrator models will be shown.

THRUSH & CO., H. A., W. 8th at Jefferson Sts., Peru, Ind.—Booth C-63

In attendance: Geo. H. Fox, E. D. Noland, G. O. Johnson, W. J. Johnson, L. D. Grose, T. E. Fahy, R. E. Clegg.

Exhibiting: Hot water heating specialties, featuring new improved circulator, tank drain, air eliminator, manifolds, and balancing valves.

TIMKEN SILENT AUTOMATIC DIV., 209 Washington St., Jackson, Mich.—Booths 621 and 625

In attendance: S. T. Ramey, M. F. Robbins, J. J. Morro, C. E. Watres, W. J. Chappell, J. E. Fahl, F. M. Jordan, R. E. Leobell.

Exhibiting: Gas fired home heating equipment; oil fired home heating equipment; and air conditioning equipment.

TITUS, INC., Box 810, Waterloo, Iowa—Booth 747

In attendance: J. L. Canady, J. S. Smith, G. F. Bertrand.

Exhibiting: Perimeter diffusers (steel and aluminum); door grilles (standard and new ''Thin-Core''); new ceiling and high sidewall grilles, new baseboard return grilles. Perimeter diffusers with new built-in damper, new ''Thin-Core'' door grilles, new ceiling and sidewall grilles and new baseboard return grilles will be featured.

TITUS MFG. CORP., Box 810, Waterloo, Iowa—Booth 750

In attendance: Donald L. Titus, Robert W. Titus, J. D. Davis, E. F. Averill, Richard Schermer, Marlin Cook, Bob Wirth.

Exhibiting: Complete line of ''Airfoil'' grilles demonstrating performance under varying conditions, and illustrating new ideas on design of air conditioning outlets. New safety approved line of gymnasium grilles, especially adapted for school use, and new all aluminum design with color selection and new snap-in design will be featured.

TORRINGTON MFG. CO., THE, Torrington, Conn.—Booth 67

In attendance: D. B. Robinson, R. M. Gordon, C. A. Hathaway, W. E. Cashen, A. C. Doty Jr., T. J. Oliver, W. G. Boales, S. E. Shea, Brad. Hultgren, L. C. Lindstrom, F. Hohmeister, J. W. Fry, L. A. Hennequin, A. N. Casadei, C. Crawford, M. A. Heeren, P. West, M. B. Hunting.

Exhibiting: ''Airotor'' (centrifugal) blower wheels and ''Airistocratic'' propeller fan blades.

TRANE CO., THE, LaCrosse, Wis.—Booths 902, 906, 910 and 918

In attendance: M. L. Hoglund, C. L. Ringquist, Ralph E. Lee, Richard Lubinsky, Lew Fuller, Charles Conner, Vernon Bushnell, James Whalen, William Barnard, Ted Ernst, Paul Hughes, Kenneth Ultsch, Werner Wassmandorf, William Kahlert, Harry Case, Gerry Hicke, Corb Rooks, Al Menke, E. A. Cline, Thomas Hancock, Fritz Sontag.

Exhibiting: Complete product line featuring ''CenTraVac,'' reciprocating compressor, ''Uni-Trane'' and ''Custom Air'' system, ''Climate Changer,'' fans, coils, baseboard, convector and wall-fin. A large size ''CenTravac,'' ''Climate Changer,'' ''UniTrane,'' fans, ''Delta-Flo'' fin and coils will be featured.

TRION, INC., 1000 Island Ave., McKees Rocks, Pa.—Booths 76-78

In attendance: E. W. Meyers, Jr., C. S. Stephens, G. F. Landgraf, W. R. Murdock, C. Pollock, H. Washacheck, N. R. Trout, R. W. McGuire, G. E. Karsnak, R. E. Sweitzer.

Exhibiting: ''Dill'' dust spot tester, field assembled electronic air cleaner, customed packaged unit electronic air cleaners, home unit electronic air cleaner, oil mist precipitator, mechanical traveling oil curtain unit, mechanical self washer unit, mechanical panel unit. Home electronic air cleaner and mechanical air filters will be featured.

TUTTLE & BAILEY, INC., New Britain, Conn.—Booth 31

In attendance: R. D. Tutt, W. I. Lipski, W. L. Batchelor, R. S. Rickabaugh, F. W. Adams, H. R. Hart.

Exhibiting: Grilles; registers; ceiling diffusers; air distribution accessories; high pressure air distribution equipment; baseboard heating panels; convectors. High pressure sidewall mixing plenum units, high pressure single- and double-duct ceiling diffusers and baseboard heating panels will be featured.

XXTH CENTURY HEATING AND VENTILATING CO., 96 Ira Ave., Akron 1, Ohio—Booth 207

In attendance: John Garver Kerch, R. K. Long, Walter Stashkiw.

Exhibiting: Oil and gas fired gravity and forced air furnaces.

TYPHOON AIR CONDITIONING CO., INC., 505 Carroll St., Brooklyn 15, N. Y.—Booth 650

In attendance: Don V. Petrone, Mark E. Mooney, A. G. Masiello, Peter T. Wotton, Robert A. Allen.

Exhibiting: Commercial packaged air conditioning units, 2 to 30 hp; air cooled conversion units for existing warm air systems, 2, 3, and 5 hp. ''Convert-to-Cool'' conversion unit for installation with existing warm air systems is generally new, but has been shown in the 3 hp size. The 2 and 5 hp sizes, also air cooled, have never been shown. The 30 hp packaged air conditioning unit is new.

UNION ASBESTOS AND RUBBER CO., 332 S. Michigan Ave., Chicago 4, Ill.—Booths C-54, C-56, C-58

In attendance: Edwin E. Hokin, Chester S. Stackpole, Peter B. Colwin, W. K. Smith, R. M. Anderson, Philip E. Bracht, Duane N. Quamme.

Exhibiting: Heating and packaged air conditioning equipment for stores, offices, and industry; chilled water generators and ''Dual-Vectors'' for combination heating and cooling in homes, offices, motels, hotels and institutions; convectors; unit heaters; baseboard; and wallboard radiation for wet heat application in residential, commercial, and industrial buildings. ''Dual-Vector'' and water chiller, combination hot water convector for heating and chilled water conditioner will be featured.

UNION ELECTRIC & MFG. CO., 1057 Summit Ave., Jersey City 7, N. J.—Booth 136

In attendance: Charles Rapiport, George Eulo, Sidney S. Blackman.

Exhibiting: Oil burner ignition transformers.

UNITED STATES AIR CONDITIONING CORP., Como Ave. S.E. at 33rd, Minneapolis 14, Minn.—Booths 58-59

In attendance: D. E. Feinberg, John E. Craig, L. P. Hanson, Wm. Moiselle, R. D. McLain, M. A. Stuart, E. R. Tanner, R. I. Tanner, W. W. Malloy.

Exhibiting: Dual-circuited refrigerated ''Kooler-aire.'' house ventilating sets, window type room air conditioner (1955 model), year 'round heating and cooling unit, ''Kooler-aire'' air cooled condensing unit and accessories, packaged air conditioner (1955 model), ''Modu-aire''. New equipment and redesigned models will be featured.

UNITED STATES RADIATOR CORP., 439 Penobscot Bldg., Detroit 26, Mich.—Booth 8

In attendance: J. Roy Knox, R. R. Harnetiaux, F. E. Schmuck, H. M. Gibb.

Exhibiting: Complete line of new window units which may be mounted either flush inside or flush outside and have an overall depth of only 21 in. up to the 1½ ton size; packaged coolers, 2 - 15 tons; packaged units with built-in evaporative condenser, 3 - 50 tons; companion type warm air units.

UNITED STATES RADIATOR CORP.—also see PACIFIC STEEL BOILER DIV.

UNITED STATES REGISTER CO., 344 E. Burnham St., Battle Creek, Mich.—Booth 733

In attendance: Harry G. Hollman, Everett P. Kromdyk, A. A. Stagg, Charles J. Pearson.

Exhibiting: Air conditioning registers, grilles, and accessories; dampers; diffusers. Various new styles and innovations in air conditioning registers and grilles will be featured.

UNITED STATES RUBBER CO., 1230 Avenue of the Americas, New York 20, N. Y.—Booth S-40

In attendance: C. W. Higbee, H. H. Weber, R H. Turner, H. A. Johnson, R. C. Cassidy, C. C. Moore, H. J. Cluver.

Exhibiting: "Uskon" electrical panels, 1/16 in. thick, which can be cemented to ceiling like wallpaper. Panel consists of a sheet of conductive rubber that is the heating unit, sandwiched between layers of thin plastic and aluminum foil. Radiant heating for an entire house or a single room is possible.

UNIVERSAL DIFFUSER CORP., 1360 Garrison Ave., Bronx, New York 59, N. Y.—Booth 439

In attendance: Charles Davies, H. E. Gross, B. A Kane, and others.

Exhibiting: "Flexiflo" circular adjustable air diffusers, and featuring "Flexiflo" adjustable square and rectangular air diffusers.

U. S. ELECTRICAL MOTORS, INC., 200 E. Slauson Ave., Los Angeles 54, Calif.—Booth C-162

In attendance: H. J. Coulombe, Bud Griffin, John Ash, Ray Cusato, Jim Devine, Morgan Glavin, Walt Johnson, Bob Lehman, John Tyma, Bob Werst.

Exhibiting: Industrial electrical motors—"Uniclosed" motor for standard needs; "Varidrive" motor for variable speeds; "Syncrogear" motor for slow speed, high torque; totally-enclosed motors for dusty and dirty locations; and explosion-proof motor for hazardous locations. New horizontal open and enclosed motor line conforming to the revised NEMA standards will be featured.

U. S MACHINE DIV.—see STEWART-WARNER CORP.

UTILITY APPLIANCE CORP., 4851 Alameda St., Los Angeles 58, Calif.—Booth 635

UTILITY FAN CORP., 911 E. 59th St., Los Angeles 1, Calif.—Booth 346

VAPOR HEATING CORP., 80 E. Jackson Blvd., Chicago 4, Ill.—Booth S-28

Exhibiting: Automatic "Vapor-Clarkson" steam generator; "Waikiki" space heater; "3-Way" heater for house trailers, supplying hot water for kitchen needs, warm air space heater and hot water radiator heat; relays; mercury contact thermostat; "Upgrader" hot hydraulic steam cleaner; railroad refrigerator car heater.

V & E PRODUCTS INC., Schuylkill Haven, Pa.—Booth 821

In attendance: George Valentine, J. H. Eubanks, Lionel L. Jacobs, E. R. Glassey, J. W. Combe, Earl Fountain, Joseph Casey, J. A. Blackburn, Walter C. Moriarty, Edward R. Galante, Bruce L. Jacobs.

Exhibiting: Steel water tube boilers for all fuels. Gas fired complete packaged boiler burner unit and anthracite stoker fired boiler burner unit will be featured.

VELAN ENGINEERING LTD. 6585 Jeanne Mance St., Montreal, Que., Canada—Booth S-90

VELOCITY POWER TOOL CO., 201 N. Braddock Ave., Pittsburgh 8, Pa. — Booth 328

In attendance: William G. Kulesz, Raymond E. Ginn, Jr., John M. Henry, John M. McCall, Earle A. Widemann.

Exhibiting: Air-acetylene and air-propane "Torch-O-Matics"; power driver; portable pipe threader.

VIBRATION ELIMINATOR CO., THE, 10-28 47th Ave., Long Island City 1, N. Y.—Booth C-42

VIBRATION MOUNTINGS, INC., 76-19 Queens Blvd. Elmhurst 73, N. Y.—Booth S-24

VIKING AIR CONDITIONING DIV., THE NATIONAL RADIATOR CO., 5601 Walworth Ave., Cleveland 2, Ohio—Booth 402

In attendance: Bob Main, Jack Green, Dick Gang, Frank Gibbons, Dave Ahern, Jack Carman, Woody Faison, Tom McIntyre, Mack Mackenzie, Bill Siebenthaler.

Exhibiting: Furnace blower assemblies, universal blower assemblies, duct blowers, window and attic fans, and humidifier.

VULCAN RADIATOR CO., Capitol Ave., Hartford, Conn.—Booth 409

In attendance: Gordon Bennett, Milton Lundgren, Joseph Pierce, John H. Ehn, Jack Ritz.

Exhibiting: "Trimline" baseboard radiation, "Linovector" commercial radiation, "Trimline" baseboard cooling, "Air-Trim" baseboard diffusers. Baseboard cooling and baseboard diffusers will be featured.

WAGNER ELECTRIC CORP., 6400 Plymouth Ave., St. Louis 14, Mo.—Booth 834

In attendance: J. H. Devor, H. N. Felton, G. W. Brown, L. C. Dobrunz, M. H. Nelson, A. C. Allen, L. A. Murphy, R. E. Bryant, M. B. Atkinson, J. B. Holston, M. D. Paul, S. Snyder, F. B. Minx, G. L. Neely, P. M. Postlethwaite, W. E. Prewitt, R. K. McLuen, R. Larson.

Exhibiting: Electric motors. Several new designs will be featured.

WALKER MFG. & SALES CORP., 1711 Penn St., St. Joseph 1, Mo.—Booth 405

In attendance: Andrew H. Ziph, Raymond Denning.

Exhibiting: Automatic draft regulators for space heaters, incinerators, trailers, domestic and industrial applications; draft boosters; chimney and vent caps; roof ventilators. Incinerator draft controls and trailer controls, draft booster and new domestic draft controls will be shown for the first time.

WALLACE CO., WILLIAM—see METALBESTOS DIV.

WALTON LABORATORIES, INC., 1186 Grove Ave., Irvington, N. J.—Booth C-13

In attendance: Wm. Feldermann, John B. Feldermann, J. R. Lewis, Herbert Puttbach.

Exhibiting: Complete line of "Cold Steam" humidifiers for the home, office and industry, featuring newly designed unit for warm air heat which provides "positive humidification without the use of evaporator plates, jets, nozzles, or other forms of surface evaporation."

WARREN ENGINEERING CO., Broadway, N J.—Booth S-118

WATERFILM BOILERS, INC., 36-40 New York Ave., Jersey City 7, N.J.—Booth C-125

In attendance: Ken Hanson, Vic Butler, John Deane, Bill Gray, Al Masche.

Exhibiting: Oil and gas fired packaged units, hot water heating units, completely wired and set up; baseboard radiation with large volume of water "to insure lasting heat, and with no fins to clog with dust," will be featured.

WATERMAN-WATERBURY CO., THE, 1121 Jackson St., N.E., Minneapolis 13, Minn.—Booth 114

In attendance: E. M. Delaney, Otto Griefnow, Stuart Smith, Ira Metcalf, Stan Halpurn, F. W. Legler.

Exhibiting: Warm air furnaces, and featuring "Comfortrol" zone distribution system.

WATTS REGULATOR CO., 10 Embankment St., Lawrence, Mass.—Booth 232

In attendance: Ernest Wante, Norman D. Vaughan, C. G. Noeller, W. M. Dillon, V. R. Bitzer, A. J. Harvey, Jr., G. B. Horne.

Exhibiting: Protection and control specialties for heating and plumbing systems. New line of automatic reseating temperature and pressure relief valves, ASME rated water pressure safety relief valves and boiler water feeders, as well as other hot water heating specialties, will be featured.

WAYNE HOME EQUIPMENT CO., INC., 801 Glasgow Ave., Fort Wayne 4, Ind.—Booth C-155

In attendance: N. G. Berghoff, B. G. Duer, C. V. Copeland, J. E. Nace, W. I. Chapel, J. J. Thurston, J. M. Messinger, Harold Kupferman.

Exhibiting: Oil and gas heating and cooling equipment.

WEATHERTRON DEPT., GENERAL ELECTRIC CO.—see GENERAL ELECTRIC CO., WEATHERTRON DEPT.

WEBSTER ELECTRIC CO., 1900 Clark St., Racine, Wis.—Booth 7

In attendance: P. G. Crewe, D. J. Munroe, B. T. Wiechers, L. S. Ehrich, Jr., L. E. Woolf, W. J. Wenszell, H. B. Hastings, Jr., F. Tuttle, G. Brinkerhuff, W. E. Dent.

Exhibiting: Fuel units, ignition transformers, "Delaytrol."

WEBSTER & CO., WARREN, 17th & Federal Sts., Camden 5, N.J.—Booths 414 and 418

In attendance: A. Richard Webster, Theodore L. Webster, D. F. Bennett, N. W. MacNichol, B. F. Lerch, Harold F. Marshall, L. H. Plum, C. J. Kern, D. E. Morgan, J. E. Tolan.

Exhibiting: New developments in steam specialties, heating controls, radiation and hot water heating equipment.

WEIL-McLAIN CO., Michigan City, Ind.—Booth 432

In attendance: E. R. Westphal, M. E. Mitchell, R. M. Stockwell, P. Stockwell, N. Westphal, Bill Black.

Exhibiting: Heavy duty oil fired boiler, baseboard, gas boiler, package oil boiler. "No. 9" baseboard will be shown for the first time.

WESTINGHOUSE ELECTRIC CORP., Gateway Center, Pittsburgh 30, Pa.—Booth 71

In attendance: Messrs. Miller, Delaney, Purdy, Danni, Nelson.

Exhibiting: Motors, gearmotors, thermostats, brazing electrodes.

WESTINGHOUSE ELECTRIC CORP., Gateway Center, Pittsburgh 30, Pa.—Booths 534-536-540-544

In attendance: Messrs. Cott, Thompson, Rogers, Justice.

Exhibiting: Air conditioning units and compressors, ventilating sets, "Silent Vane" fan, "Precipitron," industrial heater, air handling unit, "Speed Heaters" and coils.

WHEELCO INSTRUMENTS DIV.—see BARBER-COLMAN CO., WHEELCO INSTRUMENTS DIV.

WHITEHALL ENGINEERING CO., 1630 S. Michigan Ave. Chicago 16, Ill.—Booth C-60

In attendance: Ted Nemes, N. Weinstein.

Exhibiting: Mobile air conditioner; packaged air conditioners (2 hp through 15 hp); water chillers (1 hp through 3 hp); and "Dual-Vector" combination heating and cooling systems.

WHITE-RODGERS ELECTRIC CO., 1209 Cass Ave., St. Louis 6, Mo.—Booths 64 & 66

In attendance: L. F. Blough, R. A. Sherer, E.

Robinson, A. Petersen, E. Wechsler, E. Hartnett, H. Teasley, F. Crawford, W. Campbell, J. Powell, F. Ouweleen, R. Horton, P. McTeigue, P. McHugh, C. Moreng.

Exhibiting: Complete line of automatic controls for heating, refrigeration and air conditioning, including new thermostat for electric radiant heating, "Cushioned Power" solenoid gas valves, plug-in automatic gas pilot, and new air conditioning thermostat.

WILLIAMS DIV., EUREKA WILLIAMS CO. (DIV. OF HENNEY MOTOR CO., INC.), 1201 E. Bell St., Bloomington, Ill.—Booths 835-839

In attendance: R. C. Douglas, O. E. Nesmith, C. G. Branch, T. H. Green, C. H. MacFarland, M. P. Langdoc, D. F. Motz, F. O. Robison, H. C. Perry, J. H. Skaggs, H. H. Hackett, W. G. Gonzalez, V. A. Krouse, E. L. Dawkins, R. A. Davis, S. J. Dowling, V. E. Reed, H. H. Hurston, F. Brown, T. E. Schofield.

Exhibiting: "Oil-O-Matic" and "Gas-O-Matic" burners, complete furnace burner and boiler burner units, "Air-O-Matic" cooling units. A new low pressure oil burner will be publicly shown for the first time.

WINDMASTER CORP., P.O. Box 776, Columbus 16, Ohio—Booth C-57

In attendance: L. F. Cooper, Dan Lynch, Jack Figgins, R. W. Franks, Daniel Freedman, Morris Chapman, O. W. Dobson, Walter MacPherson, J. E. Halter, C. E. Murman, F. L. Davenport, Wm. H. Heagerty.

Exhibiting: Draft controls and "E-Z' Dapter" pipe stubs. Draft and the need for its control will be explained.

WING MFG. CO., L. J., 2300 N. Stiles St., Linden, N.J.—Booth 200

In attendance: H. S. Wheller, C. H. Smith, T. R. Peyrek, G. Nash, R. Teller, T. Harden, W. Matiez, E. Hubert, G. Spanos, B. Lyons, A. H. Hansen, R. N. Hosey, J. J. Hayes, A. W. Hein, D. J. Guerin, R. Purcell, R. Stebbins.

Exhibiting: Revolving unit heater, electric utility heater, fresh air supply heater, duct fan, forced draft blower, induced draft fan, auxiliary turbine. Draft inducer of newly improved design and designed for ease of installation will be featured.

WORTHINGTON CORP., Harrison, N.J.—Booths 948-950

In attendance: H. C. Ramsey, M. M. Lawler, E. R. Michel, F. J. Watt, W. F. Bishop, P. H. Shaw, J. C. Woodson, R. C. Hughes, J. P. McArthur, G. Tuckerman, M. Webb, P. O. Bancroft, C. V. Bengle, F. J. Blacker, A. F. Ward, P. A. McLeod, H. J. Newbauer.

Exhibiting: Year-'round home air conditioner, room air conditioner, packaged conditioner, air cooled condensing unit, water cooled condensing unit, air cooled condenser, space heater, gas fired boiler, room air unit, compressor. Air cooled condensing unit, air cooled condenser, space heater, and gas fired boiler will be featured.

YATES-AMERICAN MACHINE CO.—see LIPMAN REFRIGERATION DIV.

YORK CORP., York, Pa.—Booths 221-223-225-227

Exhibiting: New year 'round residential air conditioning units, one with gas fired heating system, another with an oil fired system, and another with the cooling part removed to illustrate flexibility of installation. A room air conditioner "that heats or cools at the turn of a dial" will be featured, and a new turbo water cooling system will be introduced. New "Yorkaire" fan window unit and induction unit for multi-story, multi-space buildings will also be shown.

YORK-SHIPLEY, INC., Jessop Pl. & P.R.R., York, Pa.—Booths S-50, S-89

In attendance: R. B. Snyder, Robert Fickes, Thom. Monk, John Saylor, C. L. Randall, J. Hauf, E. Estoclet, J. Johnson, George Frank, Roy Sanders, Al Raver, Lou Starner.

Exhibiting: "Aqua-ray" baseboard and "Radiare;" "Steam-Pak" steam generator, rotary burners; warm air furnaces, oil and gas fired; boiler units, gas and oil fired, gas and oil fired conversion burners; and featuring new "Homeaire" air conditioners, gas and oil fired; new "Levittowner Tabletopper" boiler-burner unit.

YOUNG RADIATOR CO., 709 S. Marquette St., Racine, Wis.—Booth 931

In attendance: F. M. Young, J. J. Hilt, W. G. Schlichting, H. F. Brinen, P. J. Menden, G. R. Gibson, A. E. Slaasted, P. F. Brinen, Warren Brewer.

Exhibiting: "Roomaire" conditioners, "Permaheat" baseboard convectors, unit heaters, convectors, and heating and cooling coils. The first two products will be featured.

YOUNG REGULATOR CO., 5209 Euclid Ave., Cleveland 3, Ohio.—Booth 801

In attendance: E. O. Young, W. J. Zimmer, George F. Bertrand, Barton D. Wood.

Exhibiting: Surface, flush cup and concealed damper regulators; adjustable cover concealed regulator for use in acoustical ceilings or walls; convector regulator for operating damper hinged on back of an enclosure; pressure relief damper; butterfly damper for double duct systems; remote controls, air split regulators, and accessories.

ZATKO METAL PRODUCTS CO., 20850 St. Clair Ave., Euclid 17, Ohio.—Booth S-15

In attendance: Lester T. Zatko, John L. Menart, S. F. Spirakus.

Exhibiting: Stamped steel one-piece pulleys and fractional power v-belts.

ZONOLITE CO., "Z" CRETE DIV., 135 S. LaSalle St., Chicago 3, Ill.—Booth 118

In attendance: L. D. Winkler, M. Phillips, H. A. Dixon.

Exhibiting: Underground pipe insulation.

Advisory Committee for the Exposition

Representation on the advisory committee of the Exposition is shared by the ASHAE — sponsoring society — and a number of engineering societies and trade associations in related fields. L. N. Hunter, president of the ASHAE, is chairman of the group. Other members representing functional and territorial interests of the Society are: J. E. Haines, first vice president, ASHAE; E. R. Queer, treasurer, ASHAE; P. B. Gordon, member of the Council; R. S. Dill, chairman, Committee on Research; M. F. Blankin and H. P. Gant, past presidents; L. M. Church, president, Philadelphia chapter; E. H. Taze, president, Baltimore chapter; R. L. Stinard, president, New York chapter; H. M. Patrick, president, North Jersey chapter; E. C. Hach, president, Pittsburgh chapter; J. W. McElgin, general chairman, 61st annual meeting, and C. S. Leopold.

Representatives of the cooperating groups are the following committeemen: William B. Watterson, president, Air Filter Institute; E. H. Eaker, president, American Gas Association; Scott Turner, president, American Institute of Consulting Engineers; Arthur J. Hess, recently president of the American Society of Refrigerating Engineers; F. W. Earnest, Jr., president, Anthracite Institute; A. A. Potter, president, Bituminous Coal Research, Inc.; J. DeWitt Morrow, president, Heating, Piping & Air Conditioning Contractors National Association; R. E. Ferry, general manager, Institute of Boiler and Radiator Manufacturers; Charles M. Gray, manager, Insulation Board Institute; Robert W. Nelson, president, National Association of Fan Manufacturers; C. B. Phillips, recently president of the National Warm Air Heating and Air Conditioning Association; Paul K. Addams, president, Oil-Heat Institute of America; R. A. Locke, president, Steel Boiler Institute, Inc.; and L. C. Dubs, president, Stoker Manufacturers Association.

Heating, Piping & Air Conditioning

AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS

JOURNAL SECTION

The object of the Society is to advance the arts and sciences of heating, ventilating, cooling and air-conditioning, and the allied arts and sciences, for the benefit of the general public, to encourage and conduct scientific research, and to cooperate with other organizations having the same or similar objectives.

Paths of Horizontally Projected Heated and Chilled Air Jets

By Alfred Koestel*, Cleveland, Ohio

This paper is the result of research sponsored by the AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS, INC. in cooperation with Case Institute of Technology, Cleveland, Ohio

THE PATHS assumed by horizontally projected heated and chilled air jets under the influence of buoyant forces are of practical importance when heating or cooling with outlets located on walls. When the path of a chilled air jet is such that it prematurely enters the occupied zone, considerable draft may be experienced especially if the temperature differences and velocities are still high due to insufficient mixing.

SUMMARY — An equation is given in this paper to provide a basis for predicting the path, or the rise and fall of heated and chilled air jets projected horizontally into undisturbed space. The equation is supported by test data obtained by various experimenters including data obtained by the author. The basic theory and analysis from which the trajectory equation is derived are outlined in detail.

Equation 2 gives the path or trajectory of horizontally projected heated or chilled air jets. It also defines the path in terms of the drop or rise of the jet centerline velocity axis for various distances from the discharge outlet. A typical path of a chilled air jet is shown schematically in Fig 1. The trajectory equation is compared with test data obtained by various experimenters in order to substantiate the assumptions made in the mathematical derivation of Equation 2. The detailed mathematical analyses will appear in the Appendix which will be published with the paper in the TRANSACTIONS.

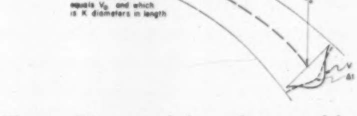


Fig. 1—Diagram of the path assumed by a chilled air jet discharging horizontally from a nozzle

Basic Equations

From the analysis presented in the Appendix and based on the simplifying assumptions already stated, the following differential equation for the trajectory of a horizontally projected non-isothermal air jet is derived as the equation:

$$(\Delta t_o \beta g D_o / V_o^2)\ [(a/b) + 1/KD_o^2]\ [1 + (dY/dX)^2]^{\frac{1}{4}} \int_o^x [1 + (dY/dX)^2]^{\frac{1}{2}}\, dX = \pm\, d^2Y/dX^2 \quad \ldots\ldots\ldots\ldots (1)$$

By assuming that the slope of the jet trajectory is not too great, an approximate solution to Equation 1 can be made (as developed in the Appendix), which results in the equation:

$$(\Delta t_o \beta g D_o / V_o^2)\ [(a/b + 1)/6K]\ (X/D_o)^3 = \pm\, (Y/D_o) \quad \ldots . (2)$$

Equation 2 approximately defines the path of the centerline axis of the jet as illustrated in Fig 1. The centerline of the jet path is the line of maximum air velocity and also of maximum air temperature difference.

Also as developed in the Appendix, the ratio a/b in Equation 2 is a function of the overall effective turbulent Prandtl number of the jet as defined by the equation:

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For presentation at the 61st Annual Meeting of the AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS, INC., Philadelphia, Pa., January 1955.

$$b/a = 4/[1 + (1/N_{\mathrm{Prt}})] - 1 \ldots(3)$$

A Prandtl number of 0.7 has been suggested for non-isothermal jets by such experimenters as Nottage[1], Forstall and Shapiro[2], and Corrsin and Uberoi[3].

Whether the sign is plus or minus in Equation 2 is determined by the fact that the vertical displacement in diameters, Y/D_o, of the jet centerline axis is the *drop* when the temperature difference Δt_o, is for a chilled jet, and the *rise* when the temperature difference, Δt_o, is for a heated jet.

The dimensionless parameter, $V_o^2/\beta \, \Delta \, t_o g D_o$, in Equation 2 is the ratio of the momentum force to the buoyant force or gravity force evaluated at the outlet.

An analytical comparison between the trajectory equation of a water jet in air and a heated or chilled air jet in air may provide an insight into the general nature of the paths assumed by fluid jets under the influence of gravity forces. The dimensionless parameter $V_o^2/\beta\Delta t_o gD_o$, which is the ratio of momentum or inertia force to the buoyant or gravity forces, can also be represented by the conventional Froude number.* The analysis will be given in the Appendix.

The constant K in Equation 2 is the familiar constant of proportionality for the centerline velocity variation of an isothermal jet as defined by the equation:

$$V_c/V_o = K/(X/D_o) \quad \ldots\ldots\ldots\ldots(4)$$

K also represents the apparent length of the constant-velocity zone occurring near the face of the outlet, for when V_c/V_o equals unity K becomes equal to X/D_o, the zone length in diameters.

The constant K has been verified experimentally by Tuve[4] and others and has been found to vary somewhat with outlet velocity, with the percentage free area of the outlet (if covered with a grid-type lattice), with the type of approach to the outlet, and with the amount of turbulence induced behind the outlet. Differences between the jet density and the density of the receiving medium affect the values of K only when the jet temperature difference, Δt_o, is excessively large. For outlet velocities above 1000 fpm and diameters greater than 6 in., values for K of 6.0 to 6.5 are representative of many tests on nozzles. Experimental indications are that K is a function of the Reynolds number (evaluated at the discharge nozzle) only in the

Symbol	Inlet face velocity V_o fpm	Room air temperature °F	Inlet air temperature °F	Inlet dimensions (open holes) inches	Equivalent diam of inlet, ft	$\frac{V_o^2}{\beta \Delta t_o g D_o}$
○	1000	80	60	11 x 11	1.035	226
△	1000	80	60	16 x 8	1.060	220
□	1000	79	60	19 x 7	1.085	227
▽	1000	81	61	28 x 5	1.120	209
◇	1000	82	62	36 x 4	1.130	208

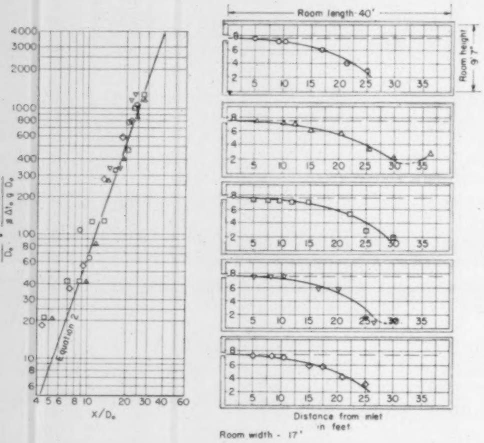
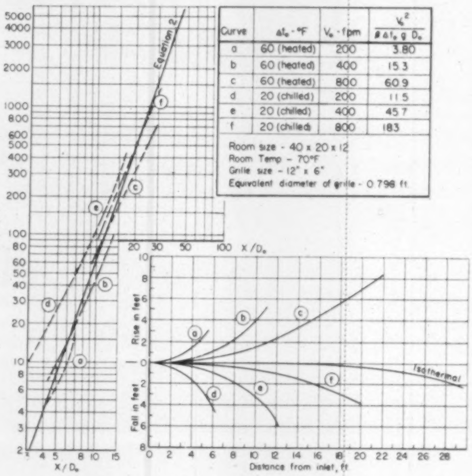


Fig. 2—Centerline trajectories of chilled air jets in a room from rectangular open holes compared with Equation 2 (from data reported by D. W. Nelson and D. J. Stewart[5])



Curve	Δt_o - °F	V_o - fpm	$\frac{V_o^2}{\beta \Delta t_o g D_o}$
a	60 (heated)	200	3.80
b	60 (heated)	400	15.3
c	60 (heated)	800	60.9
d	20 (chilled)	200	11.5
e	20 (chilled)	400	45.7
f	20 (chilled)	800	183

Room size - 40 x 20 x 12
Room Temp - 70°F
Grille size - 12" x 6"
Equivalent diameter of grille - 0.798 ft

Fig. 3—Centerline trajectories of heated and chilled air jets from a 12 x 6 in. grille compared with Equation 2 (from data reported by J. H. Van Alsburg[6])

Nomenclature

a = shape factor for the velocity profile.
b = shape factor for the temperature difference profile.
D_o = nozzle diameter, feet.
g = acceleration due to gravity, feet per (second) (second).
K = distance from nozzle face to the termination of the apparent constant velocity zone in diameters. K is the familiar constant of proportionality for air jets[4].
Δt_o = air temperature difference at the discharge outlet, Fahrenheit degrees.
V_c = maximum centerline air velocity at distance X, feet per second.
V_o = air velocity at the discharge outlet, feet per second.
X = horizontal distance from the discharge outlet, feet.
Y = vertical displacement of the maximum velocity axis, feet.
β = coefficient of expansion. For a perfect gas β equals $1/T_a$ where T_a is the absolute temperature of the ambient air in degrees Rankine.
N_{Prt} = overall effective turbulent Prandtl number of the non-isothermal jet.
N_F = ratio of the square root of the momentum force to buoyant force or gravity force and equal to $\sqrt{V_o^2/\beta\Delta t_o g D_o}$ for a gas (also equal to the Froude number in hydraulics).
N_R = Reynolds number.

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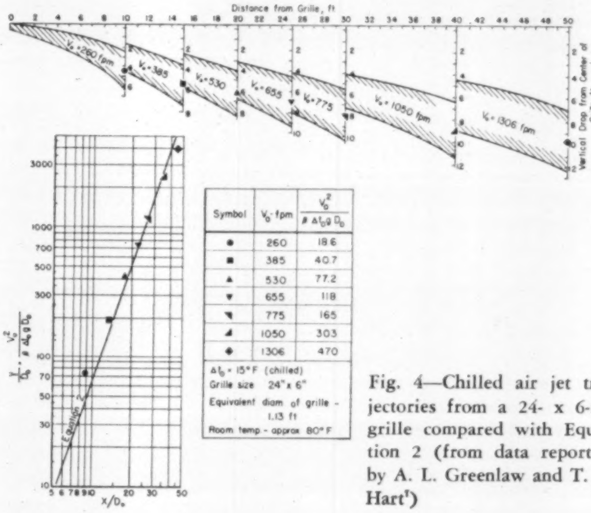
[1] Exponent numerals refer to References.

*The parameter, $V_o^2/\beta\Delta t_o gD_o$, is similar to the dimensionless parameter called the Froude number in hydraulics. The Froude number is equal to the square root of the ratio of the momentum force to the gravitational force in a fluid.

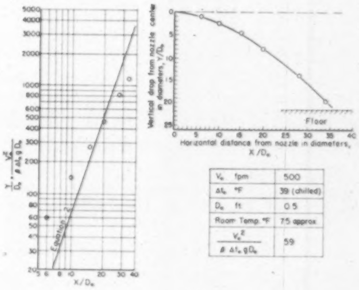
lower ranges, and that for a Reynolds number greater than about 3 × 10^4, values of K will be greater than 6.0. If the apparent point source of the jet as determined by the angle of expansion of the velocity profile is located on the face of the nozzle, the value of K in Equation 2 based on available test data can be expected to range from 6.5 down to approximately 4.0 depending on the Reynolds number evaluated at the jet outlet.



Symbol	V_o-fpm	$\frac{V_o^2}{\beta\,\Delta t_o g D_o}$
●	260	18.6
■	385	40.7
▲	530	77.2
▼	655	118
◥	775	165
◢	1050	303
◆	1306	470

Δt_o = 15°F (chilled)
Grille size 24" x 6"
Equivalent diam of grille - 1.13 ft
Room temp - approx 80°F

Fig. 4—Chilled air jet trajectories from a 24- x 6-in. grille compared with Equation 2 (from data reported by A. L. Greenlaw and T. S. Hart[4])



V_o fpm	500
Δt_o °F	39 (chilled)
D_o ft	0.5
Room Temp. °F	75 approx
$\frac{V_o^2}{\beta\,\Delta t_o g D_o}$	59

Fig. 5—Centerline trajectory of a chilled jet from a 6-in. nozzle compared with Equation 2 (from data reported by H. B. Nottage[1])

Method of Analysis

The jet trajectory is analyzed in terms of principles involving conservation of thermal energy and the equating of the buoyant forces to the change in jet momentum. The differences in rates of momentum transfer and heat transfer are taken into account by the use of an overall effective turbulent Prandtl number. Available experimental knowledge of free air jet behavior is used wherever possible to evaluate constants in the derived equations.

An equation describing the path of horizontally projected non-isothermal jets can be formulated if the following simplifying assumptions are made:

1. The absolute value of the air density is constant throughout the jet, but the differences in density are taken into account when the buoyant forces are considered. This assumption is valid if the temperature differences between the jet and the surroundings are not too great. Temperature differences normally involved in the application of jets to space heating or cooling can be considered not too great.

2. The velocity and temperature-difference profiles in the fully developed region of the jet can be represented by an error-function type curve or normal probability curve. This has been found experimentally to be a satisfactory assumption.

3. The difference between the temperature-difference profiles and velocity profiles at a given section of the jet is due to the difference between heat and momentum diffusion in a turbulent jet. This difference in diffusion rate can be expressed by the use of an overall effective turbulent Prandtl number.

4. The rate of spread or expansion of the temperature-difference and velocity profiles are constant along the curved trajectory of the air jet, but differ in value due to the difference between heat diffusion and momentum diffusion.

5. The velocity and temperature-difference profiles remain symmetrical about the centerline of the curved path of the air jet. See Fig. 1.

6. Thermal energy (or enthalpy flow) is conserved along the curved path of the air jet.

7. In order to mathematically solve Equation 1, which is the differential equation of the jet trajectory, and to derive Equation 2, an assumption was necessary that the slope of the jet trajectory is not too great.

Comparison With Test Data

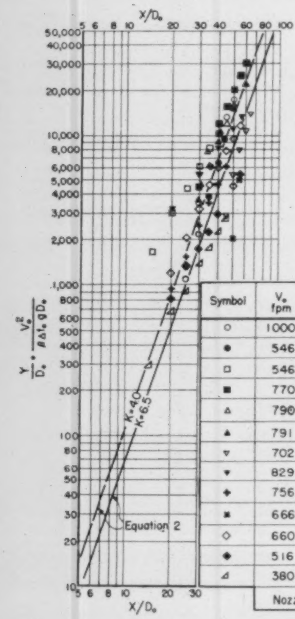
In Fig. 2, Equation 2 is compared with test data obtained by Nelson and Stewart[5] on chilled air projected into a room from outlets of various dimensions. Equation 2 is plotted for a value of $a/b + 1$ equal to 2.54 which corresponds to an overall effective turbulent Prandtl number of 0.7 in Equation 3. A value for K of 6.5 was selected for the plot of Equation 2 in Fig. 2. With a N_{Prt} equal to 0.7 and a K of 6.5 Equation 2 becomes:

$$0.065\ (\beta \Delta t_o g D_o/V_o^2)\ (X/D_o)^3 = \pm\ (Y/D_o) \quad \ldots .(5)$$

which is the equation plotted in Fig. 2.

The test points of Nelson and Stewart lying on the termination of the dotted portion of the curves defining the jet path as shown in Fig. 2 are not compared on the plot with Equation 2 because the chilled air jet paths had already been influenced by the floor. The paths of the air jets shown in Fig. 2 were determined by means of smoke and by velocity traverses made with a deflecting vane type anemometer.

In Fig. 3, Equation 2 is compared with test data obtained by Van Alsburg[6] on the trajectories of heated and chilled air jets from a 12- x 6-in. grille. Note the relatively low momentum force and large buoyant force ($V_o^2/\beta\triangle t_o g D_o = 3.84$) for the trajectory defined by curve "a". The same values for K and N_{Prt} were used in plotting Equation 2 in Fig. 3 as in Fig. 2. The paths of the air jets shown in Fig. 3 were determined by means of smoke discharged through the outlet. In his tests Van Alsburg also determined the path of an isothermal jet for comparison with the paths of the heated and chilled jets. The slight downward path of the isothermal jet shown in Fig. 3 is probably caused by room air currents external to the jet, and serves to emphasize the effect of extraneous disturbances on the trajectories of jets.



Symbol	V_o fpm	Δt_o °F (Chilled)	Room Temp. °F	$\frac{V_o^2}{\beta \Delta t_o g D_o}$	$(N_R)_o$
○	1000	25	73	2060	9300
●	546	15	75	1100	4800
□	546	15	75	1100	4800
■	770	11	75	3000	6700
△	790	15	75	2320	6950
▲	791	10	75	3480	6800
▽	702	16	75	1710	6210
▼	829	34	72	1110	7940
✚	756	33	72	955	7200
✖	666	30	72	818	6260
◇	660	30	72	800	6190
◆	516	32	72	459	4920
⊿	380	32	72	249	3620

Nozzle Diameter = 1 inch

Fig. 6—Centerline trajectories of chilled jets from a 1-in. nozzle compared with Equation 2 (from data obtained at Case Institute of Technology)

In Fig. 4, Equation 2 is compared with test data obtained by Greenlaw and Hart[7] on chilled air jet paths from a 24- x 6-in. grille for different outlet velocities and for a temperature difference of 15 deg below room temperature. The agreement between test data and Equation 2 is good even for the lower outlet velocities. The same values for *K* and N_{Prt} were used in plotting Equation 2 in Fig. 4 as in Fig. 2. The paths of the air jets shown in Fig. 4 were determined by means of smoke discharged through the outlet, and were checked by probing for the edge of the jet by a direct reading anemometer.

From the tests made by Greenlaw and Hart,[7] they conclude that neither grille aspect ratio, nor breaking up the air stream into individual jets at the grille, nor converging the individual jets had any effect on the drop of the air stream.

In Fig. 5 Equation 2 is compared with test data obtained by Nottage[1] on the path of the centerline velocity axis of a chilled air jet from a 6 in. nozzle with an outlet velocity of 500 fpm and a temperature difference of 39 deg below room temperature. The same values for *K* and N_{Prt} were used in plotting Equation 2 in Fig. 5 as in Fig. 2. Nottage's test data indicate a parabolic trajectory or a slope of two for the test points in Fig. 5 compared to a slope of three according to Equation 2. The path of the chilled air jet centerline velocity was determined by means of velocity traverses made by a specially designed heated thermocouple anemometer.[1]

In Fig. 6, Equation 2 is compared with test data obtained at Case Institute of Technology on the path of chilled air jets discharged from a 1-in. nozzle at different velocities and temperatures. Note that Equation 2 is plotted in Fig. 6 for two different values of *K* but for an overall effective turbulent Prandtl number of 0.7 in both cases. The paths of the chilled air jets were made visible by titanium tetrachloride smoke generated in a plenum chamber on which the nozzle was mounted. A photograph was taken of the smoke pattern and the trajectory coordinates were visually measured on this photograph, then plotted in Fig. 6. When the drop in diameters of the centerline velocity axis of the jet is about 5, an error of ±1 diameter is possible when visually evaluating the centerline locus of the smoke pattern from the photograph. In addition, errors may result from the fact that the diffusion of smoke in an air jet involves the turbulent Schmidt number which may result in some discrepancy between the centerline of the smoke path and the path of the maximum centerline velocity axis. Fig. 7 is a typical photograph of a chilled air jet path.

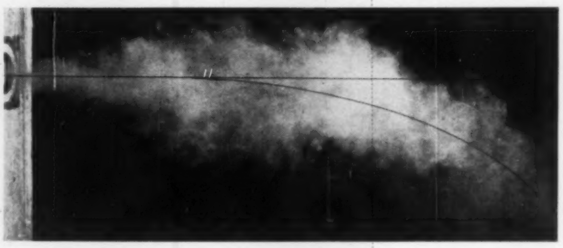


Fig. 7—Smoke path of a chilled air jet from a 1-in. nozzle showing estimated maximum velocity centerline axis. ($\Delta t_o = 15$ F; $V_o = 546$ fpm)

The path of the chilled air jets emanating from a 1-in. nozzle proved to be erratic and to be very susceptible to ambient room air disturbances since the magnitude of the disturbing force is appreciable contrasted to the relatively small momentum force of the discharging air jet. For large nozzles the ambient disturbing forces could be minimized. Curtains were hung in the vicinity of the air jet to reduce the effect on the jet trajectory of air currents that normally exist in a large laboratory. Fig. 7 is an instantaneous picture of a fluctuating air jet trajectory, and therefore, the data plotted in Fig. 6 should be statistically evaluated. By visual examination of the data in Fig. 6, the curve of Equation 2 for a *K* of 4 seems to be the better statistical representation of the data. The agreement of the data with this lower *K* value is to be expected, due to the relatively low Reynolds numbers involved in air jets from a 1-in. nozzle. Note that the tabulated Reynolds numbers in the legend of Fig. 6 are low contrasted to the Reynolds number values (3×10^4) that should be realized for *K* values greater than 6.

Data obtained at Case on the rise of horizontally projected heated jets from a 2-in. nozzle are presented in Figs. 8 and 8a. The data were evaluated from photographs of smoke patterns using a procedure similar to the evaluation of the data presented in Fig. 6. In Fig. 8 it can again be noted that the data tends to group around a *K* value which is lower than 6.5 due to low Reynolds numbers at the jet discharge. (See Fig. 8a for tabulated values of Reynolds numbers). Even though considerable scatter exists for the data shown in Fig. 8, the trend is for the test points to *band* with a spread of approximately ±50 percent around some estimated mean curve through the data. Fig. 9 shows a typical photograph of the smoke path of a heated jet.

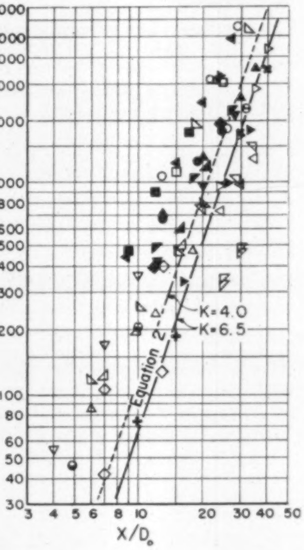


Fig. 8—Centerline trajectories of heated air jets from a 2-in. nozzle compared with Equation 2 (from data obtained at Case Institute of Technology)

In Fig. 10 is shown a summary of the test data on the heated and chilled jet trajectories presented in Figs. 6 and 8, and an envelope encompassing all of the test points in Figs. 6 and 8 is illustrated and compared with Equation 2 for two values of *K* and for a turbulent Prandtl number of 0.7.

The author believes that certain refinements in experimental technique and test equipment would have reduced the spread in the experimental test data shown in Figs. 6 and 8 to approximately ±25 percent.

Practical Example

As a simple example in finding the drop of a horizontally projected chilled air jet, consider a 1 ft diameter nozzle discharging chilled air with a temperature difference of 20 deg and with a velocity of 1000 fpm. The room air temperature is 75 F. It is required (*a*) to find the drop of the maximum centerline velocity axis at a distance of 30 ft from the nozzle, and (*b*) to determine the drop of the lower edge of the chilled air jet also at a distance of 30 ft.

Symbol	V_o (ft/min)	ΔT_o (heated)	$\frac{V_o^2}{\beta \Delta t_o g D_o}$	$(N_R)_o$
▷	658	22	547	10740
◁	600	38	264	9820
◸	426	45	112	6960
✚	518	40	187	8470
✖	834	22	879	13620
◑	1320	21	2300	21600
◉	1380	20	2650	22600
◹	605	20	510	9910
◓	720	20	720	11770
◺	212	14	90	3470
◿	215	20	64	3510
△	216	26	50	3530
▽	217	31	42	3550
◇	217	38	38	3550
◒	219	44	31	3590
□	1030	28	1043	16780
○	1040	27	1108	17000
◣	1030	27	1090	16800
◢	861	34	606	14100
▲	654	25	476	10700
▼	654	24	495	10700
◆	660	31	390	10800
■	748	37	419	12200
●	750	41	381	12250
▶	756	47	338	12350
◀	870	52	404	14220
◤	875	56	381	14320

Room temperature 78°F

Fig. 8a—Legend for heated air jets from a 2-in. nozzle (data obtained at Case Institute of Technology)

The ratio of momentum to buoyancy is

$$V_o^2/\Delta t_o \beta g D_o = [(1000/60)^2 \times (460 + 75)]/(20 \times 32.2 \times 1) = 230$$

Assuming a *K* equal to 6.5 and a N_{Prt} equal to 0.7 the drop of the maximum centerline velocity axis computed from Equation 2 or Equation 5 is:

Solution (a):

$$0.065 \times 1/230 \times (30/1)^3 = Y/1$$
$$Y = 7.7 \text{ ft}$$

Solution (b): Since the jet boundary expands with a natural free angle of about 20 deg[4], the distance of the lower edge of the chilled jet from the maximum centerline velocity axis will be approximately (assuming that the slope of the trajectory is not too great),

$$30 \times \text{Tan } 20°/2 = 5.3 \text{ ft}$$

The drop of the lower edge of the chilled air jet is therefore,

$$5.3 + 7.7 = 13 \text{ ft}$$

Conclusions and Recommendations

Equation 2 indicates the important variables for exploring the trajectories of horizontally projected nonisothermal jets. Equation 2 has been compared with test data for ratios of momentum to buoyancy ($V_o^2/\beta \Delta t_o g D_o$) ranging from about 4 to 4000.

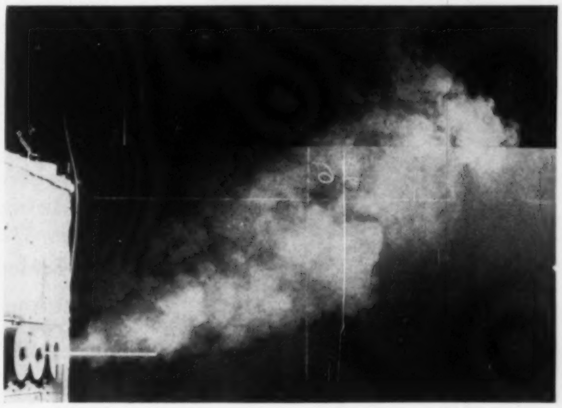


Fig. 9—Smoke path of a heated air jet from a 2-in. nozzle. (Δt_o = 26 F; V_o = 216 fpm)

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The validity of the trajectory equation has been checked to an approximation by experimental results, but suggestions are made for additional experimental work to refine the constants in the equation and to reveal additional variables. The agreement between the analyses and the data in its present form does not necessarily give a broad validation of either the data or the theory.

No attempt has been made to estimate the coefficients of discharge or the effective free areas of the grilles and outlets presented in this paper or to include these factors in the test points when comparisons are made with Equation 2. It is understood that the neglecting of the effective free areas and the coefficients of discharge would account for some of the deviation of test data from Equation 2.

Simplifying assumptions have been made in the analytical treatment of the jet problem, and further experiment is necessary to indicate the seriousness of actual deviations from each individual assumption.

Equation 2 is recommended for engineering use, pending its refinement by more rigorous experimental work. Equation 2 is not to be considered exact until full experimental verification is accomplished and any limitation on the empiricism determined.

Acknowledgments

Grateful acknowledgment is made of the financial support from the Designers for Industry, Inc. Research Foundation, Cleveland, Ohio. The author is indebted to Prof. G. L. Tuve for his help and suggestions. The figures were prepared by Mrs. Ruth E. Strahosky. The experimental work on the smoke trajectories was performed by E. Cox and the photographs were taken by J. Sturman, both Students in Mechanical Engineering.

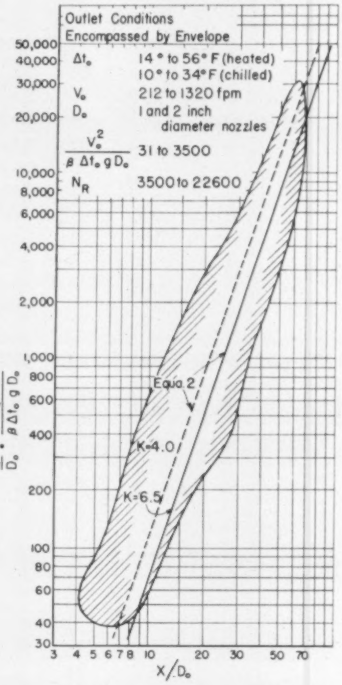

Fig. 10—Envelope containing all data on heated and chilled trajectories of Figs. 6 and 8 compared with Equation 2

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JOURNAL SECTION

Ventilation Requirements for Cigarette Smoke

By C. P. Yaglou*, Boston, Mass.

SUMMARY — The purpose of this study was to determine the quantities of outside air required to control the disagreeable effects of cigarette smoke on the olfactory system, eyes, nose, and throat in an experimental smoking room under comfortable heat conditions.

Because of the many variable factors involved, the results are not directly applicable to practical situations, but should serve only as guides.

Analyses of tobacco and its smoke for toxic substances have been made by many investigators, notably by the Connecticut Agricultural Experiment Station[1], by Baumberger[2,3], Bogen[4], Wolman[5], and Bradford, et al[6]. The principal injurious substances found in tobacco smoke are the oily alkaloids, nicotine, pyridine and its derivatives; ammonia, aldehydes, tar and resinous compounds, smoke particles, carbon monoxide and various volatile acids. No average values can be quoted for most of these substances as the composition varies with variety of tobacco, manner of smoking, and other variables, including moisture content of the tobacco and the air.

Until recently when an association was found between smoking and lung cancer, physicians considered nicotine to be the most potent poison in the smoke. It is now generally believed that all of the substances enumerated above contribute, more or less, to the toxicity of smoke.

The burning end of a cigarette was found to give off most of the toxic material likely to affect the non-smokers[4], and presumably the ventilation requirements of confined spaces. Pyridine and ammonia, the two strongest local irritants in the smoke, are produced at this point. A portion of the nicotine in the tobacco is decomposed by heat into pyridine, and another portion is given off in the vapor phase at the burning point. Of the nicotine sucked through, a portion condenses in the unburned cigarette butt, another portion is absorbed on the respiratory walls, and only a relatively small quantity is exhaled.

A review of the literature cited shows a nicotine content of popular cigarette tobaccos varying from 1.0 to 3.5 percent of moisture-free tobacco weight, or from 10 to 35 mg in a standard cigarette weighing about 1 gm. The amount of nicotine in the smoke is placed at between 0.4 and 1 percent of tobacco weight (4 to 10 mg in a standard cigarette). From 15 to 35 percent of this amount appears in the smoke reaching the mouth, and about 65 percent of the nicotine entering the mouth may be retained in *puffing*, or as much as 90 percent in inhaling[2,3].

Table 1—Sensory Scale for Strength of Tobacco-Smoke Odor, or for Degree of Irritation to Eyes, Nose, and Throat

Degree, odor or irritation	Description
0	*Imperceptible* odor, or irritation.
1	Perceptible odor, or irritation, but *not objectionable*.
2	Moderate odor, or irritation, little or no objection, *acceptable* level.
3	*Objectionable* odor, or irritation; condition regarded with disfavor.
4	Strong odor, or irritation, but *endurable*.
5	Very strong odor, or irritation, *intolerable*.

Note to Subjects and Observers: Record separately strength of odor and irritation, stating also locus of irritation. Record occurrence of headache, if any, and give an overall opinion as to acceptability.

The immediate effects of exposure to high concentrations of tobacco smoke are irritation of the eyes and respiratory mucosa due to combustion products of tobacco and cigarette paper, and constriction of small blood vessels cutting down the blood supply to various parts of the body. The cardiovascular changes are ascribed to a poisonous action of nicotine on nerve endings controlling blood flow. They have been repeatedly demonstrated in the literature by a rise of systolic and diastolic blood pressures, an increased heart rate, and a drop of the skin temperature of the extremities, which explains the slight chill in the hands and feet sometimes experienced by normal persons after smoking. Smoking corn-silk cigarettes, which contain no nicotine, failed to produce such vascular changes, while the intravenous ingestion of nicotine in amounts comparable to those absorbed in smoking standard cigarettes, produced analogous effects[7,8].

Acute, as well as chronic, effects of tobacco smoke are not confined to smokers alone, but may appear in non-smokers who inhale the smoke of others, especially in persons who are allergic to tobacco smoke[9,10,11].

The ventilating engineer is interested chiefly in the short-term functional effects, giving warning of more serious effects that may follow if the early signs were not heeded. The presence of unpleasant tobacco smoke odors as perceived by non-smokers and, to a greater degree by visitors upon entering a smoking room, gives the first evidence of inadequate ventilation. The odor is not due to pyridine alone, but to many odors from ammonia, aldehydes, nicotine, tarry matter, volatile acids, and other substances in the smoke.

The appearance of irritation in the eyes, nose, or throat, with smarting and lachrymation, coughing, or sneezing among non-smokers, is a sign of harmful ventilation conditions. Although ammonia and pyridine are the strongest local irritants, many of the other substances in the smoke, including nicotine, contribute to irritation. Much more important than the local irritation of the conjunctiva, from the medical standpoint, is the effect of nicotine on the optic nerves capable of causing impairment of vision in heavy smokers[10], who are affected more by the fresh smoke they inhale than by the diluted smoke in the air of a room.

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*Professor of Industrial Hygiene, Harvard School of Public Health. Member of ASHAE.

[1] Exponent numerals refer to References.

For presentation at the 61st Annual Meeting of the American Society of Heating and Air-Conditioning Engineers, Inc., Philadelphia, Pa., January 1955.

Evaluation of Tobacco Smoke Odors

There is no satisfactory technique for measuring objectively the strength of tobacco smoke odors as perceived by the sense of smell. Various types of *osmometers* have been designed to evaluate odor strength by determining the amount of odor-free air required to dilute an odor to the olfactory threshold. All of these instrumental aids have drawbacks. They require the use of nose catheters, or blasts of air into the nostrils, which seriously interfere with the normal perception of odors. Particles of tobacco smoke are adsorbed on interior wall surfaces of the instrument, and must be scrubbed off after each inhalation.

The possibility of developing an objective physical or chemical indicator of tobacco smoke concentration, or of its odor strength, also seems remote, because tobacco smoke is a complex of many known and unknown odorous substances whose concentration varies widely with the variety of tobacco, the age of the smoke, and the manner in which a cigarette is smoked. Recently, Gant and Shaw[12], Leopold[13], Kuehner[14] and others made some interesting exploratory studies along these lines but they have not gone far enough to ascertain the practical usefulness and limitations.

Table 2—Summary of Ventilation Requirements for Controlling Disagreeable Effects of Tobacco Smoke on the Olfactory System, The Eyes, Nose, and Throat

EXPERIMENTAL CONDITIONS	
Net floor area of smoking room	155 sq ft
Net air space of smoking room	1410 cu ft
Number of subjects smoking simultaneously	3 to 4
Total number of subjects exposed to tobacco smoke in each test	8 to 9
Duration of tests	2 to 4 hr
OUTSIDE AIR SUPPLY 6 CFM PER SMOKER (no recirculation)	
Thick bluish haze in the air.	
Smarting and watering of eyes in all smokers, and most non-smokers and observers (*visitors*).	
Irritation of nose and throat, as above, with occasional coughing.	
Headache after 2 to 4 hours in all smokers and some non-smokers.	
Tobacco smoke odor imperceptible, as such, to all.	
Measurable increase of pulse rate and blood pressure.	
Conditions strongly objectionable to all concerned.	
OUTSIDE AIR SUPPLY 14 CFM PER SMOKER (no recirculation)	
Visible smoke haze in the air.	
Dryness or irritation of eyes, nose, or throat of smokers, and of some non-smokers and observers.	
Possible headache in few smokers and non-smokers.	
Tobacco smoke odor difficult to perceive, as such.	
Conditions unacceptable to all concerned.	
OUTSIDE AIR SUPPLY 26 CFM PER SMOKER (no recirculation)	
Occasional trace of smoke in the air (spotty).	
Possible dryness in nose or throat.	
No definite effect on eyes.	
Odor imperceptible to smokers, acceptable to most non-smokers, and somewhat objectionable to most of the observers.	
OUTSIDE AIR SUPPLY 35 CFM PER SMOKER (no recirculation)	
Air visibly clear of tobacco smoke.	
No effects on eyes, nose, or throat.	
Odor imperceptible to smokers and non-smokers, and acceptable to all but a few of the observers.	
OUTSIDE AIR SUPPLY 60 CFM PER SMOKER (no recirculation)	
Air visibly clear of tobacco smoke.	
No effects on eyes, nose, or throat.	
Odor imperceptible to all subjects, and only slightly above threshold level in the opinion of observers.	

In the present study the strength of tobacco smoke odor was evaluated by the sense of smell alone, according to an arbitrary 5-point scale shown in Table 1. The same scale was used for evaluating irritation on the eyes, nose, or throat. Aside from simple tests for carbon monoxide, no chemical measurements were made of any of the other toxic substances in the air.

In using the sensory odor scale (Table 1), the observers first breathed odor-free air for at least 10 min to rid their olfactory membranes of any residual odor, before *sniffing* the smoky air. One or two sniffs produced the strongest odor perception, after which the sensation diminished owing to olfactory fatigue. The breathing of odor-free air again, restored sensitivity. For full response the nose had to be neither too dry nor too moist, and the observers had to abstain from smoking or eating for at least one hour before testing. Persons with colds, deflected septums, or injuries to the upper respiratory or olfactory mucosa were disqualified as observers. The agreement between observers, after a little practice, was within 1 point on the odor scale. A reproducible average was obtained by using six or more qualified observers.

Excellent reviews of recent knowledge on the anatomy and physiology of olfaction, and on subjective and objective measurement techniques, are those by McCord and Witheridge[15], and by Miner and Turk[16].

Procedure

The experiments were made in two adjoining rooms, described in conjunction with our previous work on ventilation requirements for body odors[17,18]. These rooms are nearly identical, having a floor area of 155 sq ft, a ceiling height of 9 ft 3 in., a window area of 20 sq ft, and a net air space of 1410 cu ft. The windows and doors are weatherstripped, and all cracks are sealed with adhesive tape. Walls and ceilings are finished with two coats of scrubbable paint. The floors are covered with smooth battleship linoleum kept unwaxed for the tests. Individual air-conditioning systems can maintain the two rooms at a comfortable temperature and humidity, regardless of weather. The downward distribution system is used, with the air entering through perforations near the ceiling and leaving at floor level. Variable speed fans (D.C. motors) allow a wide range in the quantity of air supplied which is measured by orifice meters.

In the present study, one of these rooms was used as a test room, where smoking and non-smoking subjects exposed themselves to various concentrations of tobacco smoke, while sitting on armchairs, and engaging in reading, writing or conversing. The other room served as a control room for the observers on the odor panel, who appraised the strength of odor and irritation, if any, according to the scale in Table 1, by passing from the control to the test room twice every hour, or so. The control room was kept odor-free by circulating outside air at a rate of 15 changes per hour, and by restricting the number of observers occupying the room to not more than three at a time. A small, tight-closing door equipped with a curtain trap allowed access between the two rooms.

The thermal conditions in the two rooms were approximately identical in any one test. They were adjusted according to the comfort of the subjects, and varied from 72 F to 76 F with 25 to 35 percent relative humidity in the winter, and from 75 F to 81 F with 40 to 65 percent relative humidity in the summer.

Usually nine subjects took part in each test, three non-smokers who merely exposed themselves to the smoke of others, and six smokers. Only three of the latter smoked at any one time, taking turns with the three reserves. As a rule, subjects were not allowed to smoke more than 4 cigarettes per hour, and never more than 5 in emergencies when some one of the smokers failed to come to the test. In long tests, some of the smokers had to be relieved by new subjects near the middle of tests. The subjects smoked their favorite brand of cigarettes in their own accustomed manner. The total number of cigarettes smoked per hour was approximately 12 (11.8), and the average time in consuming one cigarette down to the last ¾ in. was about 7½ min.

In addition to the observers' records, all of the subjects kept records of their own, using the standard sensory scale shown in Table 1. Each test consumed from 2 to 4 hr, depending on the time required to attain a steady odor level. Altogether, 34 men participated as subjects and 15 as observers in 16 tests. Thirty of the subjects were junior or senior Harvard Medical School students; the remaining four were older men working at the School of Public Health. The observers were nearly equally students and employees.

Results

Outside Air Supply in Relation to Strength of Odor and Irritation Effects: Results of five series of tests with average outside air supplies of 6, 14, 26, 35, and 60 cfm per smoker are shown in Table 2 and Fig. 1.

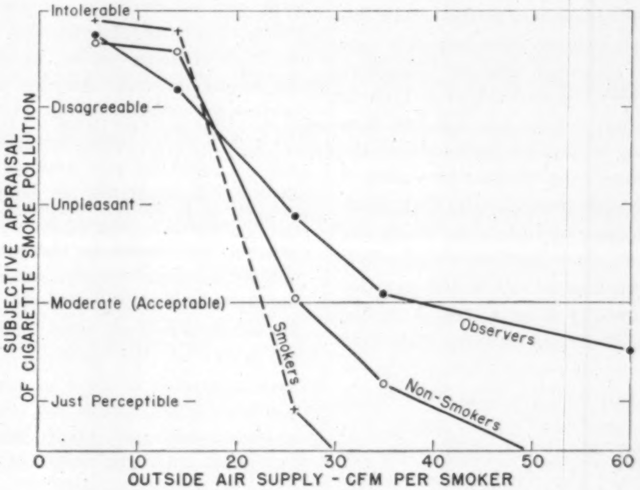

Fig. 1—Subjective appraisal of tobacco smoke pollution produced by three smokers in an experimental smoking room (10.0 x 15.5 x 9.25 ft) at various rates of air flow. Non-smoking occupants of room merely breathed the smoke in the air. The observers (*visitors*) recorded their impressions immediately upon entering the room

An outside air supply of 35 to 40 cfm per smoker was required to remove objectionable cigarette smoke odors, as judged by observers upon entering the smoking room from odor-free air. The odors involved were those emanating from relatively fresh tobacco smoke†. Body odors seldom could be smelled in the presence of smoke odors. Not much was gained by increasing the air flow beyond 35 cfm per smoker under the experimental conditions (Fig. 1).

Non-smoking subjects, who merely exposed themselves to the smoke of others, considered as acceptable an air supply of only 25 cfm per smoker on the basis of odor alone, which they could perceive, though less keenly than the observers, until the air supply was cut down to 14 cfm per smoker. At this reduced air flow there was distinct irritation of the eyes, nose and throat, strong enough to interfere with sense of smell. Headaches appeared when the air supply was reduced to 6 cfm per smoker, after exposures of one to three hours. The dense smoke in the air produced a feeling of depression and loss of concentration power for reading.

Although the smokers were unable to smell the smoke odor, as such, they were more susceptible to headaches and irritation of eyes, nose and throat than the non-smokers, at the lowest two air flows (Table 2).

In the light of this experience, it would seem that ventilation requirements for tobacco smoke should be based on the amount of tobacco actually consumed in a unit of time, rather than on the total number of occupants, smokers and non-smokers, as is sometimes done in practice without taking into consideration a suitable load factor. Since body odors normally cannot be smelled in the presence of tobacco smoke odor, a non-smoker actually helps in reducing the pollution, instead of contributing to it, by absorbing some of the smoke in his respiratory tract and clothing.

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†The characteristics of stale tobacco smoke have been discussed in a previous report[18].

Carbon Monoxide Concentration in Smoking Room: The *CO* content of tobacco smoke presented no problem for the non-smoker in this study. Although concentration of this gas at the burning end of cigarettes sometimes reached values as high as 200 ppm, only a trace of less than 5 ppm could be detected in the breathing zone of the room after 4 hr of continuous smoking with ventilation rates of from 5 to 7 cfm per smoker. The maximum allowable concentration of *CO* is 100 ppm for exposures of 8 hr a day. A review of the literature indicates that even in heavy smokers, the accumulation of *CO* in their blood is not particularly significant[19].

Application and Limitations of Findings: The results presented here are not directly applicable to practical situations, but should serve only as guides. They were obtained under more or less ideal conditions, in a relatively small room, that was kept always clean, and was supplied with air from a clean ventilating system through which no smoky air ever was recirculated during the tests. The findings do not apply to systems using recirculated air that has been treated by processes capable of altering the natural composition of tobacco smoke, such as, filtration, adsorption, spray washing, dehumidification, cooling with coils, etc.

No data are available in the literature on the allowable toxic threshold of nicotine, to ascertain whether the proposed dilution rates for controlling odors, or irritation effects are, in fact, adequate to control possible nicotine effects on non-smokers. According to the literature the most prominent functional effect of nicotine is that on the cardiovascular system. An attempt was made to correlate ventilation rates with increases of pulse rates and blood pressures observed in our experiments, but the changes were too small and too variable to justify conclusions.

It is hoped that research now in progress, or under consideration, by the Tobacco Industry Research Committee, and the *American Cancer Society*, will provide the ventilating engineer with the toxicological data he needs for solving his problem.

Conclusions

An outside air supply of 35 to 40 cfm per smoker was required in order to remove objectionable odors of fresh cigarette smoke, as judged by observers upon entering an experimental smoking room (10.0 × 15.5 × 9.25 ft) from clean air. The rate of smoking was kept constant at about 12 cigarettes per hour.

Non-smoking subjects who merely inhaled the smoke in the air considered as acceptable an outside air supply of 25 cfm per smoker. The smokers themselves were incapable of perceiving the smoke odor, as such, regardless of air flow. But they were more susceptible to irritation of eyes, nose and throat, than the non-smokers or observers, when the ventilation became deficient.

Distinctly unhealthful conditions resulted when the air supply was reduced to less than 15 cfm per smoker, with headaches, smarting and watering of the eyes, irritation of the nose and throat, a feeling of depression, and a loss of concentration power for reading, among both smokers and non-smokers.

The carbon monoxide concentration was much too small to affect the non-smoker, even at the lowest air flow of 5 cfm per smoker, when the room was filled with bluish smoke.

There is no way to ascertain now whether the ventilation requirements for controlling smoke, odor, and irritation effects are in fact adequate to protect a non-smoker from possible effects of nicotine and of other poisonous smoke ingredients of unknown toxicological thresholds.

Acknowledgments

Much credit is due to E. C. Riley for his assistance in initiating this study, and to the many Harvard Medical School students and employees of the School of Public Health who served as subjects or observers.

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A Rapid General Purpose Centrifuge Sedimentation Method for Measurement of Size Distribution of Small Particles

Part I – Apparatus and Method

By K. T. Whitby[*], Minneapolis, Minn.

This paper is the result of research sponsored by the American Society of Heating and Air-Conditioning Engineers, Inc., in cooperation with the Mechanical Engineering Department, University of Minnesota, Minneapolis, Minn.

SUMMARY — This first of two papers describes the apparatus and basic principle of a new method of centrifuge sedimentation analysis which has been found to be of great practical value for measurement of size distribution of dusts in the 0.05 to 100 micron size range. Extensive use by six different industrial firms has demonstrated that the method for the first time permits economical and rapid size analysis in the 0.05 to 5 micron size range occupied by most atmospheric dusts.

Included are descriptions of apparatus, basic derivations and outlines for practical methods of calculation of necessary tables and results.

The rapid increase in industrial development and concentration of urban dwellers has placed increased emphasis on the need for more effective air cleaning.

The air filtration problem generally resolves itself into a need for knowledge of contaminants present in atmospheric air. These contaminants can be broadly classified as particulate matter, gaseous matter, air-borne bacteria, viruses and odors.

The American Society of Heating and Air-Conditioning Engineers, Inc., through its Technical Advisory Committee on Air Cleaning[†] fully realizes the magnitude of this air pollution problem. The Society is, however, presently confining its activities to a study of particulate matter which exists in air that ventilates spaces used for human occupancy.

This first paper presents a new method of particle-size measurement which has been found to be of practical value for measurement in the 0.05 to 100 micron size range. Part I describes the apparatus and basic method. Part II will describe detailed procedures applicable to a variety of applications.

Problems of particle-size measurement are almost as varied as industry itself. For example, size measurement is important in the production of such substances as flour, paint pigments, powdered sugar and insecticides. In recent years the air pollution problem has received increasing attention, and a need exists for rapid yet comprehensive methods for evaluating atmospheric dust samples.

These and similar needs in other fields of particle technology have generated interest in size analyses because of the fundamental importance of size distribution data.

The literature in size analysis is voluminous and scattered widely in various scientific journals. Lately this situation has been improved by a number of comprehensive reviews covering all methods of size analysis. Several good ones are given by Schweyer and Work[1], Heywood[2], Stairmand[3], and Rose[4]. Two recent reviews which also have fairly extensive bibliographies are Herdan[5] and Work and Whitby[6].

Study of the literature shows that only the microscopic and sedimentation methods have been used widely for the subsieve range. Microscopic analysis by electron beam or light can be used from 0.01 micron up but the procedures are tedious and inaccurate except for narrow size ranges. For this reason, sedimentation analysis has been the most widely used. All sedimentation or elutriation methods use the relationship between particle size and settling velocity derived from Stokes' law. Hawksley[7] has given an excellent discussion of the basic principles of sedimentation analysis.

Stokes' law states that the settling velocity of a particle in a fluid is proportional to the square of the particle diameter. For this reason the settling velocity of particles below 5 microns in size becomes rather slow. For example, a 1 micron particle of density 2.5 would require about 24 hr to settle 10 cm in water. Thus, for practical reasons gravity sedimentation is usually limited to 1 micron and larger. By using a centrifuge to increase the force on the particles, the sedimentation analysis may be extended to the finer size ranges. This is the approach used in the development of the method described in this paper.

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For presentation at the 61st Annual Meeting of the American Society of Heating and Air-Conditioning Engineers, Inc., Philadelphia, Pa., January 1955.

[1] Exponent numerals refer to References.

Basically, the method combines gravity and centrifuge sedimentation to take advantage of the desirable characteristics of each. This approach is not new. For example, Norton and Speil[8] constructed a centrifuge large enough so that standard hydrometers and jars could be used.

Most centrifuge methods start with an initially homogeneous suspension in the tube. Robison and Martin[9] and Kamack[10] describe recent improvements in this approach. The one serious drawback in the use of a homogeneous suspension in a centrifuge is the complication involved in the calculation of results. The fact that various size particles are settling out at any given time, plus the fact that the forces on the particle vary with the radius in the centrifuge, precludes any exact solution to the differential equations that describe the rate of sedimentation. This difficulty can be eliminated by making the radius of the centrifuge large compared to the sedimentation height, or by starting all the particles off in a layer on top of the sedimentation liquid. The latter approach, first used by Marshall[11], is the one used in the method described in this paper.

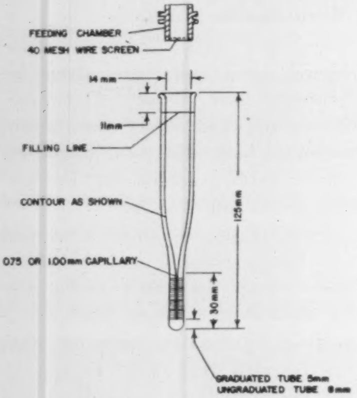

Fig. 1—Centrifuge tube and feeding chamber design

Several different methods have been used for sensing the rate of sedimentation. Kamack[10] describes an ingenious system of withdrawal pipettes which can be operated while the centrifuge is in motion. Svedberg[12] made extensive use of optical methods in his ultracentrifuges. Norton and Speil[8] used a hydrometer, and Berg[13], a specific gravity diver. However, all of these either require elaborate apparatus or careful technique. For these and other reasons a simple capillary at the bottom of the centrifuge tube has been used to measure sediment height.

Table 1—Size Analysis Data for A.C. Fine Test Dust Analyzed Benzene

Particle size Microns	Reading time Min Sec	Centrifuge r.p.m.	Observed height on screen	Percent Greater than size	Percent Less than size
60	:18		0	0	100
50	:26		0.2	0.8	99.2
40	:40		0.9	3.5	96.5
35	:53		1.3	5.0	95.0
30	1:12		2.0	7.7	92.3
25	1:43		3.0	11.5	88.5
20	2:41		4.5	17.2	82.8
16	4:12		5.9	22.6	77.4
12	:18	300	8.3	31.8	68.2
8	:24	600	11.3	43.4	56.6
4	:38	1200	16.7	64.0	36.0
2	1:03	1800	20.4	78.2	21.8
1	3:22	1800	22.4	85.8	14.2
0.5	12:34	1800	23.8	91.4	8.6
±0	15:00	4000	26.1	100.0	0

Note: Room temperature = 80 F; Sedimentation liquid = Benzene; Feeding liquid = 40 percent Benzene + 60 percent Naphtha; Dispersing agent = 0.1 percent Twitchell 8240 $\rho = 2.52$ gm per cubic centimeter; $\rho_o = 0.87$; $\eta_o = 0.00582$ poise; $K = 6.45 \times 10^4$. Dispersed 2 min in a blender.

Principle of Operation

Basic to the method is the special centrifuge tube and feeding chamber illustrated in Fig. 1. At the beginning of a size analysis the clean tube is filled to the line near the top of the tube with a suitable sedimentation liquid. The tube is then placed in a holding device, which may be simply a laboratory clamp on a ring stand, or may be a more elaborate optical observing device as illustrated in Fig. 2.

Next a suspension of particles is made up in a liquid that is miscible with the sedimentation liquid and has a slightly lower density and a slightly higher viscosity. The particles must be practically insoluble in either liquid. An aliquot of this suspension is placed in the feeding chamber and the chamber placed in the tube and released in such a way so as to leave a sharp layer of suspension on top of the sedimentation liquid.

Then, at times calculated from Stokes' law for the desired sizes, the height of the sediment in the capillary is read. Sedimentation is allowed to proceed under gravity for 4 to 10 min depending upon the time schedule that has previously been worked out. Then the tube is transferred to the first and lowest speed centrifuge and run for a precalculated time. The tube is removed to read the sediment height and then is replaced in the centrifuge for the next time interval. This is continued until there is no change in sediment height or until the last centrifuge time in the schedule has been run. During the centrifuge runs the speed is increased as the settling velocity of the particle decreases.

By proper choice of liquids, centrifuge speeds, and reading times, it is possible to determine size distribution at the rate of 2 per hr on such materials as the A.C. fine test dust, illustrated in Fig. 3 and Table 1. If this size analysis had been run by straight gravity sedimentation, it would have required approximately 54 hr as compared to about 25 min by centrifugal analysis.

Application of the method has been broad. Equipment and procedures are the result of the combined experience of six industrial firms and the University of Minnesota on over 50 materials ranging from paint pigments to D.D.T. insecticide.

Though extensive, the equipment required is simple enough so that some version of the method is within the reach of every laboratory. Fig. 2 illustrates the complete apparatus used in making a size analysis. The method is very flexible. Size analyses can be made on samples as small as 2 mg. One or 20 points on the distribution curve may be determined and the method is especially suitable for obtaining accurate analyses of samples containing a few percent of large particles.

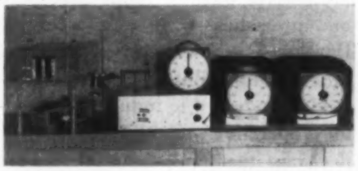

Fig. 2—Complete centrifuge size analysis equipment. (l. to r.) Projection reading apparatus, tubes in rack, micro stirrer, 300 rpm centrifuge, 600-1200 rpm and 1800 rpm centrifuge

Calculation of results for routine analyses is simple, requiring only a few calculations on a slide rule. Details of the calculations involved and preparation of schedules will be described later. Selection of liquids, dispersing agents and dispersion methods will be discussed in Part II (to be published).

Apparatus

Centrifuge Tubes: The tube design that has been developed is illustrated in Fig. 1. The graduated tubes, which can be read without any optical accessories, are necessary for the analysis of certain materials. Ungraduated tubes are satisfactory for most materials. Paint pigments and other submicron materials form an optically opaque suspension in the capillary above the sediment. Though it is possible to see the line of demarcation with the unaided eye, it is often impossible when using the projection system.

The ungraduated tubes used with a suitable projection system are desirable for most size analysis work. Magnification of the capillary image six times, as in Fig. 4, permits easier, more accurate reading of sediment height. The magnified image also makes it easy to see if dispersion is satisfactory and to see the actual shape and number of the few largest particles.

Tube size is such as to fit the standard 15 ml tube shields and heads available on most small centrifuges. Other tube dimensions have been worked out from experiment and from consideration of what it is practical to make from glass. It has been found that the two parts of the tube most difficult to make and also the most important are the transitions from the cylindrical portion to the capillary and the flat bottom of the capillary.

In addition to the tube design shown in Fig. 1, a special open-ended design having a bore of 0.17 mm is under development for use with impinger dust samples and other applications where the concentration of dust in the feeding liquid is very low.

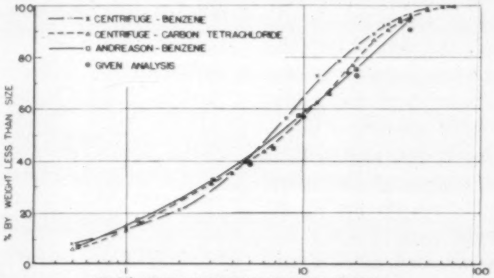

Fig. 3—Particle size analyses of A.C. fine test dust

Centrifuges: Early attempts to use ordinary laboratory centrifuges showed that while they can be used, they have many serious drawbacks. The major disadvantage is lack of speed stability. Acceleration rates are too low at the low speeds and too high at the high speeds. Also it is very difficult to control these rates without major reconstruction of the centrifuges.

Some of the smaller commercial centrifuges can be used if an accurate stroboscope is available and if they are operated with covers open in order to keep the tubes at room temperature and to increase aerodynamic resistance.

Considerable experimentation has established the following centrifuge characteristics as necessary:

1. Speed must be constant within 1 percent of the values used in calculating the tables.
2. Maximum rate of acceleration during starting and stopping must be less than 5 rad per (sec) (sec).
3. Speed *vs* time curves during starting and stopping must be known and constant enough so that starting and stopping correction will not vary more than ±0.5 sec.
4. It is desirable to have a 300-600 rpm range for the slowest centrifuge.
5. For ease of operation it is desirable that no adjustment of rheostats or other speed control equipment be necessary during the starting and stopping period of the centrifuge. This is to permit the centrifuge to be started and stopped by an automatic timer of suitable accuracy.

The foregoing requirements dictated the design of the special centrifuges illustrated in Fig. 2. These centrifuges are powered by multi-speed hysteresis type synchronous motors. Three centrifuges have been developed so far. A 300-600 rpm unit is powered by a 600-1200 rpm motor with a 2 to 1 gear reduction between motor and head. A 600-1200 rpm unit is direct driven as is an 1800 rpm unit. Starting and stopping characteristics are controlled by a combination of an inertia disk on the motor shaft and a variable resistor in series with one winding of the motor. For some locations a wave form correcting-type voltage regulator is necessary to obtain constant starting characteristics.

For convenience a 1-sec to 1-hr timer is built into each centrifuge. All of the work to date has been done with centrifuges equipped with small commercial heads. These two-place heads were used because they were the smallest standard heads available. Use of other heads with slightly different trunnion radii would have no effect other than to change the radii used in the calculation of time schedules.

Tube-Reading Equipment: It was found desirable to tap the tube gently on the tip along the axis of the tube during the gravity portion of the run. Therefore, for both the graduated tubes and the projection tubes, the tube holder is provided with a cam operated tapper which strikes the tube a light blow on the tip 40 times per minute.

For the ungraduated tubes a special projection system is used to read the tubes. Fig. 4 is a close-up of the screen and illustrates the type of scale and image obtained. Fig. 5 illustrates in schematic form an improved version of the optical unit which is now under construction. The tube should be out in the open so that sedimentation can be observed in the whole tube and so that the lamp heat will not cause convection currents. Space for more than one tube is provided in a sliding rack so that more than one analysis can be run at the same time. This is also the reason for the double optical system of the instrument illustrated in Figs. 2 and 4.

Miscellaneous Equipment: Several small but essential items go to complete the apparatus as follows:

1. *Feeding chamber* — as illustrated in Fig. 1 — is essential for obtaining a uniform layer of suspension on the surface of the sedimentation tube.

2. Fig. 6 illustrates a *cleaning wire* and *powder scoop*. Closed end tubes are cleaned by pumping this wire rapidly in and out of capillary with the tube full of liquid. The *powder scoop* is used for measuring out a given volume of powder when the dispersion is made directly in the feeding chamber. This is particularly convenient for routine analyses on materials reasonably easy to disperse.

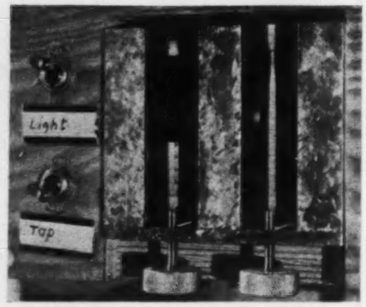

Fig. 4—Projected image of tube (*left*) with sediment (*right*) empty tube. (Note image is inverted)

3. Fig. 6 also illustrates a *special micro-stirrer* that can be used to stir the suspension in the feeding chamber. This makes it unnecessary to make up a separate suspension in a blender or other stirring device. Using a motor that will develop at least 10,000 rpm, this micro-stirrer will disperse all but the most difficult materials.

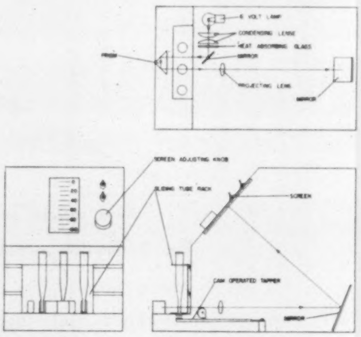

Fig. 5—Schematic diagram of improved projection unit

4. *High speed commercial centrifuge* — A commercial centrifuge that will develop approximately 2,000 g's is useful for obtaining end points on very fine materials such as paint pigments. A small medical centrifuge is satisfactory for this purpose.

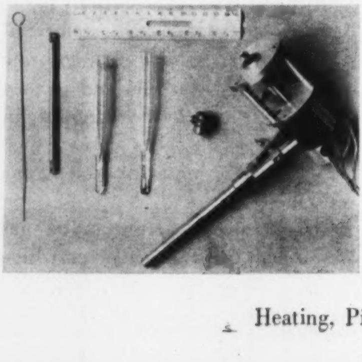

Fig. 6—Miscellaneous equipment. (*l. to r.*) Cleaning wire, powder scoop, graduated tube, ungraduated tube, feeding chamber, and micro-stirrer

Calculation of Tables

Because this method combines both gravity and centrifugal sedimentation, it is most convenient to calculate the reading times completely before a run is begun. Though there are several ways of doing this, only one procedure will be given here. Developed in collaboration with Dr. M. A. Knight, this procedure is particularly adapted to industrial laboratory operations since it reduces the decisions that must be made during the computation.

Gravity Portion of Tables: The time for a particle to settle a given distance in a fluid under the influence of gravity can be calculated from the usual form of Stokes' law.

$$t_g = (18 \times 10^8 \eta_o h)/[(\rho - \rho_o) g d^2] \quad \ldots\ldots\ldots\ldots (1)$$

where

t_g = time in seconds for a particle to settle a distance h under the influence of gravity.
d = particle diameter, microns.
h = settling height, centimeters (10 cm for all tubes).
ρ = true density of particles, grams per cubic centimeter.
ρ_o = density of sedimentation liquid, grams per cubic centimeter.
η_o = absolute viscosity of sedimentation liquid, poise.
g = gravitational constant.

if we let

$$K = (18 \times 10^8 \eta_o h)/[(\rho - \rho_o) g] \quad \ldots\ldots\ldots\ldots (2)$$

then Equation 1 becomes:

$$t_g = K/d^2 \quad \ldots\ldots\ldots\ldots (3)$$

Since K will be a constant for a given material in a given sedimentation liquid, the gravity reading times may be calculated by multiplying the calculated K value by $1/d^2$ values pre-calculated in tabular form. Table 2 illustrates a few $1/d^2$ values used in calculating the time schedule of Table 3.

Centrifuge Portion of Table: Centrifuge settling times can be calculated by a form of Stokes' law for a centrifugal field that is derived as follows:

Let r represent the radius of rotation of a particle of mass m rotating about an axis with angular velocity ω. At equilibrium, two forces will be acting on the particle; a frictional force determined by Stokes' law and a centrifugal force.

Table 2—Values of $1/d^2$ Used in Table 3

d - microns	$1/d^2$
70	2.04×10^{-4}
60	2.78×10^{-4}
50	4.00×10^{-4}
40	6.25×10^{-4}

Equating these we obtain:

$$3\,\pi\,\eta_o d\,(dr/dt) \times 10^8 = m\,\omega^2\,r.$$

In a liquid the effective mass of a spherical particle will be:

$$m = (\pi/6)\,d^3\,(\rho - \rho_o)$$

Therefore:

$$dr/dt = [(\rho - \rho_o)\,\omega^2 d^2 r]/(18 \times 10^8\,\eta_o)$$

Integrating between the starting radius r_1, and the final radius r_2 we obtain:

$$t_c = t_2 - t_1 = \{(18 \times 10^8\,\eta_o)/[(\rho - \rho_o)\,\omega^2\,d^2]\}\,\log_e\,(r_2/r_1)\ \ldots\ldots\ldots(4)$$

where

t_c = the centrifuge running time necessary to centrifuge a particle of size d from r_1 to r_2.

In both Equations 3 and 4, the slightly different density and viscosity of the feeding and sedimentation liquid have been neglected. This approximation is valid because the thickness of the feeding layer is small and usually the density and viscosity differences are small.

The K-values may also be defined from Equation 4 if the centrifuge speeds are selected. If we let K_s represent the K-value associated with a given centrifuge speed s, then:

$$K_s = (18 \times 10^8\,\eta_o)/[(\rho - \rho_o)\,\omega_s^2]\ \ldots\ldots\ldots\ldots\ldots\ldots\ldots(5)$$

Equation 4 becomes:

$$t_c = (K_s/d^2)\,\log_e\,(r_2/r_1)\ \ldots(6)$$

By equating Equations 2 and 5, K_s may be expressed in terms of K as shown in Table 3.

In Equation 6, r_2 is a constant for a given tube and head design, but r_1 will depend not only on the radius of the top of the tube but on how far the particle has already settled under the influence of gravity.

Therefore

$$r_1 = r_o + 10\,(t_g/t_{cg})\ \ldots\ldots\ldots(7)$$

where

t_g = time for last gravity particle size d_g to settle 10 cm under gravity.

t_{cg} = time for first centrifuge particle size d_c to settle 10 cm under gravity.

r_o = starting radius of all particles in the feeding layer at $t = 0$.

Table 4—Portion of a Table of Q Values used to Calculate Centrifuge Running Times[a]

	d_g, microns			
d_c microns	16	15	14	13
14	0.00099	0.0052		
13	0.00175	0.00123	0.000649	
12	0.00277	0.00219	0.00159	0.000842
11	0.00417	0.00353	0.00281	0.00199
10	0.00613	0.00542	0.00459	0.00367
9	0.00892	0.00811	0.00719	0.00614
8	0.0130	0.0121	0.0110	0.00984
7	0.0191	0.0181	0.0169	0.0156
6	0.0288	0.0278	0.0264	0.0249
5	0.0454	0.0442	0.0427	0.0410
4	0.0764	0.0749	0.0733	0.0713
3	0.144	0.142	0.140	0.138
2	0.337	0.336	0.334	0.331
1	1.383	1.381	1.379	1.376
0.5	5.576	5.576	5.576	5.576

[a] Q valves calculated for r_o = 3.30 cm and r_2 = 13. 30 cm.

If Equation 3 is substituted into Equation 7

$$r_1 = r_o + 10\,d_c^2/d_g^2)\ \ldots\ldots\ldots(8)$$

We see that r_1 is a function only of the last gravity size and of the centrifuge size under consideration. This makes it convenient to set up a simple calculation scheme for the centrifuge portion of the run in which use is made of a calculation constant tabulated as a function of d_g and d_c.

Table 3—Calculation of Reading Schedule of $K = 6.45 \times 10^4$

RPM	Values of K_s	Values of J_s
300	$0.0992\ K = 0.640 \times 10^4$	$100\ 1/K = 0.00155$
600	$0.0248\ K = 0.160 \times 10^4$	$525\ 1/K = 0.00814$
1200	$0.0062\ K = 0.040 \times 10^4$	$2900\ 1/K = 0.0450$
1800	$0.00276\ K = 0.0178 \times 10^4$	$14{,}500\ 1/K = 0.225$

d_g, in Microns	t_g, in Seconds	d_g, in Microns	t_g, in Seconds	
70	13.2	30	71.7	$t_g = K/d_g^2$
60	17.9	25	103.3	
50	25.8	20	161.0	
40	40.3	16	252.0	
35	52.6			

d_c	t_c*	C_s	t_{ct}	RPM	Q
12	17.7	0	17.7	300	0.00277
8	18.0	+6.0	24.0	600	0.0130
4	25.4	+12.4	38.0	1200	0.0764
2	46.7	+16.0	63.0	1800	0.337
1	186.0	+16.0	202.0	1800	1.383
0.5	738.0	+16.0	754.0	1800	5.576

RPM	*$t_{cn} = (Q_n - Q_{n\text{-}1})K_s$, Seconds
300	$0.00277 \times 0.640 \times 10^4 = 17.7$
600	$(0.0130 - 0.00277)\ 0.160 \times 10^4 = 18.0$
1200	$(0.0764 - 0.0121)\ 0.040 \times 10^4 = 25.4$
1800	$(0.337 - 0.0764)\ 0.178 \times 10^4 = 46.7$
1800	$(1.383 - 0.337)\ 0.0178 \times 10^4 = 186.0$
1800	$(5.576 - 1.383)\ 0.0178 \times 10^4 = 738.0$

In Equation 6, define Q by:

$$Q = (1/d_c^2)\,\log_e\,(r_2/r_1)\ \ldots\ldots\ldots(9)$$

then

$$t_c = K_s\,Q\ \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots(10)$$

Substitution of Equation 8 into Equation 9 yields:

$$Q = (1/d_c^2)\ \log_e\ \{r_2/[r_o + (10d_c^2/d_g^2)]\}\ \ldots\ldots\ldots(11)$$

Equation 11 may then be used to calculate a table of Q values such as in Table 4, for apparatus with given r_o and r_2 values.

Before illustrating how a table of Q's is used to calculate a complete reading schedule, it is convenient to define one other constant. When preparing a reading schedule such as in Table 3, the question arises as to just what particle-size intervals and centrifuge speeds are desirable.

There is not too much of a problem during the gravity portion of

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the run because practically any size intervals may be used. However, during the centrifuge portion, a number of factors must be considered. Due to computational difficulties, it is impractical to have a centrifuge running time less than the starting time of the centrifuge at that speed. In Table 3 for example, the first centrifuge time at 12 microns is 17.8 sec. For this centrifuge the minimum useful timer setting is 10 sec. If the centrifuge time for a size of say 14 microns was to be calculated, it would be found that the centrifuge time would be only 6.3 sec, which is below the useful time and therefore impractical. The same problem exists when changing to higher speeds.

To aid in selecting the best combination of sizes and speeds, it is convenient to define the minimum useful increment in Q that can be used for each centrifuge speed.

In Equation 10, t_c is the centrifuge running time assuming that the centrifuge runs at the given speed for the whole interval. Actually a starting and stopping correction is necessary because in most cases it is inconvenient to balance the starting time against the stopping time. Later it will be shown how this correction is obtained but for the present it is sufficient to say that it is a constant which is added algebraically to t_c in order to get the timer setting t_{ct}.

Therefore,

$$t_{ct} = t_c + C_s = K_s Q + C_s \quad \ldots. (12)$$

where

C_s = the starting stopping correction at speed S.

t_{ct} = the centrifuge timer setting necessary.

The minimum useful increment in Q may now be calculated by setting t_{ct} equal to the starting time of the centrifuge.

$$t_{ct} = t_{\text{starting}} = K_s\, J_s + C_s$$

or

$$J_s = (t_{\text{starting}} - C_s)/K_s \quad \ldots\ldots (13)$$

where

J_s is the minimum useful increment in Q at the speed s. As an example, for the 600 rpm centrifuge $C_s = +\ 6$ sec, and t starting = 19 sec,

therefore

$$J_{600} = (19 - 6/K_{600}) = (13/0.0248K) = (525/K)$$

Table 3 illustrates how these Q and J values are used to calculate a complete schedule. A convenient step-by-step procedure is outlined.

1. Using Equation 2, calculate K for the given conditions of density and viscosity.
2. Calculate $1/K$, K_s and J_s values as at the top of Table 3.
3. Calculate the gravity portion of Table 3 from Equation 3 and a suitable table of $1/d^2$ values. It is best to terminate the gravity portion of the run between 4 and 10 min. The minimum gravity time permissible will depend on the centrifuge equipment available and the size interval from the last gravity to the first centrifuge size.

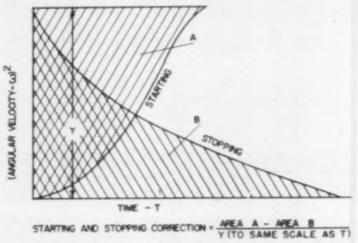

Fig. 7—Typical starting and stopping curves

4. Select the first centrifuge size so that $Q_1 > J_{s1}$. In the example $J_{300} = 0.00155$ and therefore for $d_g = 16$ microns it is seen from Table 4 that $d_c = 13$ microns is the maximum particle size that could be selected for the first centrifuge size. In this case 12 microns were selected because the interval from 12 to 16 microns was small enough. Calculate t_c from Equation 10, using a Q value corresponding to $d_g = 16$ and $d_c = 12$ and K_{300}. Add the appropriate start stop correction to get the time setting t_{ct}.

$$t_{ct} = Q_1\, K_s^1 + C_s^1$$

5. Select the next centrifuge size so that $Q_2 > Q_1 + J_{s2}$. The problem now arises as to whether to use the centrifuge speed used for d_{c1} or go to a higher speed. In this case $Q_1 + J_{300} = 0.00432$ and $Q_1 + J_{600} = 0.0109$. From Table 4 it is seen that the maximum d_{c2} that could be used with 300 rpm centrifuge is 10 microns and with the 600 rpm centrifuge, 8 microns. Since the interval from 12 to 8 microns is satisfactory, we choose the 600 rpm centrifuge in order to save time. Then for the example:

$$\begin{aligned} t_{ct} &= Q_2\, K_{600} - Q_1\, K_{600} + C_{600} \\ &= 0.0130 \times 0.160 \times 10^4 - 0.00277 \\ &\quad \times 0.160 \times 10^4 + 6.0 = 24 \text{ sec.} \end{aligned}$$

6. Subsequent centrifuge size intervals and centrifuge times are calculated using the same procedure. Because the starting and stopping of the centrifuges and the handling of the tube causes a small amount of mixing in the tube, centrifuge reading sizes should be limited to a maximum of seven. Actual experience has indicated that five is usually sufficient.

Where many size analyses must be run on a variety of materials it is convenient to make up tables of appropriate reading schedules calculated for increments of K. Tables calculated for successive increments having a ratio of 1.025 over a range from 5 x 10^4 to 25 x 10^4 will cover the most used range.

Determination of Starting and Stopping Correction

Due to the short runs that are made with the centrifuge, the starting and stopping correction becomes an appreciable fraction of the running time. This makes a precise determination of the correction necessary. The following scheme has been found to be satisfactory.

A stroboscope is used to obtain accurate angular velocity time data during starting and stopping. This is accomplished by observing the time at which the centrifuge reaches a speed preset on the stroboscope.

From Equation 4, it is apparent that the settling velocity at a given radius is proportional to the angular velocity squared. Therefore, if the angular velocity squared is plotted against the time during starting and stopping (Fig. 7), the area under the starting and stopping curves will be proportional to the distance settled during the respective times. The net correction is, therefore:

$$\text{Net correction} = \frac{\text{Area A} - \text{Area B}}{\text{Y (to same scale as T)}}$$

Calculation of Results

Calculation of results from the sediment height *vs* time data is simple. The percentage of particles by weight larger than a given size is obtained by dividing the sediment height at that size by the total sediment height. For example in Table 1 the percent larger than 12 microns is

$$(8.3/26.1) \times 100 = 31.8 \text{ percent}$$

The percent undersize, or the frequency distribution may be obtained in the usual manner from the percent larger than distribution.

Typical Data

Fig. 3 illustrates a typical particle-size analysis obtained with this method as compared to the standard Andreason pipette and the size analysis supplied by the makers of the dust. At this time it will merely be stated that reproducibility and agreement with other methods have been found to be entirely satisfactory for all but a few unusual situations. Considering the compromises that have been made in the development of the method, agreement with other methods is good.

Acknowledgment

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ASHAE RESEARCH DIRECTOR WAS *ASRE* PANEL SPEAKER

Participating in a panel discussion on research during the 50th Annual Meeting of *ASRE* in Philadelphia on November 30, E. L. Kaiser, Society research director, offered some ideas on how that organization could participate in research work.

Mr. Kaiser suggested that they should engage in basic but practical research sponsored at existing institutions supported by funds from industry and *ASRE* members. He advised against professional societies becoming involved in product development and testing of competitive products, which he believes is a function of industry.

During the past months, Mr. Kaiser also has spoken at the Annual Meeting of *The Institute of Boiler and Radiator Manufacturers* in Absecon, N. J., and addressed several Chapters of the Society in a report on active projects at the Research Laboratory in Cleveland.

CHICAGO MEMBERS DISCUSS CITY'S VENTILATION CODE

Proposed revision of the Chicago Ventilation Code interested Chicago Society members to the extent of devoting the November meeting of the Illinois Chapter to a panel discussion of this subject with E. P. Heckel acting as moderator. Panel members represented the building department, consulting engineers, contractors and architects. Serving on the panel were S. I. Rottmayer, J. J. Aeberly and Rudolph Houkal.

In opening the forum Mr. Heckel defined the requirements of a reasonably good city code as *fair, just, purposeful, logical and practical.* He said it should not incur undue or unnecessary costs on either the city or the owners, builders, architects, consulting engineers and contractors.

Discussing the performance of a good ventilation system, Mr. Heckel outlined the essential components of air and their relationship to human life. He explained how more energy is consumed as physical exertion increases; this places a greater demand on the respiratory system for more than the usual supply of oxygen.

The importance of removing dust particles from air used for industrial ventilation purposes because of health aspects, as well as comfort requirements, was one of the proposals under consideration by the code committee. Also being investigated was a new table of specifications which could be used more effectively in defining a specific application and its related ventilation requirement. Still another major problem confronting the code committee is solving what the city building department wants in the way of compliance with the standards it has set up as minimum fresh air requirements.

Opportunities Await ASHAE

Dear Members:

This is the last opportunity I shall have to write to you as President of your Society, and I have considered what I should say in a final message. Probably what impresses me most, as I end my year in office, is the feeling of optimism I have for the future of our Society and the great opportunities which lie ahead. Therefore, of the many things I would like to discuss, I feel moved to speculate on certain aspects of the future of our Society, our profession, and our industry. I would like to impart some of my optimism and enthusiasm to our members.

Our Objective Is Public Service

In order to appreciate our opportunities it is necessary that we understand the kind of organization we are and our fundamental purposes. These are not as clearly understood by some of our members or by the public as we would like. The Society is an educational and scientific organization, and our objective is to advance the arts and sciences of heating, ventilating, cooling, and air conditioning, and the allied arts and sciences for the benefit of the general public.

Occasionally a member expresses chagrin when he learns for the first time that we are organized for public benefit rather than primarily for the benefit of our profession. Some ask if our purpose is practical and realistic.

Actually, we do much for the members of our profession, but the things we do are to enable them to serve the public better rather than to further the interests of the individual member or the profession itself.

How We Can Serve

Our objective, to be of public service, is sound because no enterprise can be successful unless it serves the public or serves those who are serving the public. The most important man to our industry is JOHN Q. PUBLIC, himself, and if he does not feel that he has need for our services and our products, we are out of business.

How can we serve the public, thereby creating a demand for our services and our products? The Society cannot do this by itself, but it can contribute a great deal toward this objective.

Through research, education, and other scientific endeavors, we can establish facts proving to the public the value of adequate heating, ventilating, and air conditioning and its relation to human comfort, health, efficiency, and well-being. This will not only benefit the public, but also will create a tremendous demand for our services and products.

Can you visualize what would happen if the public should suddenly demand better heating and air-conditioning systems in homes, in the schools which their children attend, in the hospitals, public buildings, restaurants, and places of entertainment, and in the office buildings and factories in which they work?

The public is not sufficiently conscious today of the need for better indoor environment. This is evidenced by the fact that a very large percentage of buildings today are heated by poor or mediocre heating systems, and a very small percentage are air conditioned. The public seems to cheerfully accept indoor environments today that need not be tolerated in the future.

Purchaser Needs Knowledge

Many homes are being purchased today by people, who pay relatively little or no attention to the heating and air-conditioning system when building or bargaining for a home. As long as the builder considers that the heating and air-conditioning system is a relatively unimportant factor in the sale of the house, why should he spend more money installing a better system? If the prospective purchaser, however, would pay more attention to the system when he buys the home, and make some pointed inquiries about it, the builder would learn very quickly to provide a good system as an additional selling feature.

Landlords and real estate men also would realize that in order to rent their homes or offices or hotel rooms, they would have to provide better indoor comfort.

The employer would learn that he must provide better indoor environment, in office and factory, to secure better help and maintain employee operating efficiency and personnel relations at a high level.

As a result of this stimulated demand for better environment, the contractor would find that he has more work to do. There would be a greater demand for the services of consulting engineers to design better systems for private, commercial, and industrial buildings. The manufacturer would benefit by the greater demand for better designed and quality-made products.

Financial institutions would be skeptical about financing any building which was not properly heated, ventilated or air conditioned. Public utilities would benefit by the increased requirements for energy. Industry would have to employ and train more engineers, salesmen, technicians and mechanics.

If an increased public demand for improved systems can be stimulated by furnishing proof to the public of the greater value of better heating, ventilating and air conditioning, it will create the greatest modernization program that any phase of the building industry has ever experienced. The Society can contribute greatly towards this objective by the development, interpretation, and dissemination of the technical facts and basic principles which establish and prove human requirements for better indoor environment.

If the Society can develop and prove scientifically the best human environmental conditions, it will give our profession and its allied industries sound promotional facts which may be published in newspapers and shelter magazines to get this story across to the public. These publications will publish articles pertaining to health and comfort because such information appeals to the public. This will serve to make the public more conscious of the need for better heating and air conditioning, thereby creating a greater demand for it.

Establish the Need

The basic fundamental in marketing is to create and establish the need for a product or service in the consumer's mind. We cannot sell something to someone unless he feels he has a need for it. We must sell comfort, health, and well-being in order to sell products and services.

Markets exist because of human needs. If the expansion of markets in our field is going to depend on the general public learning the benefits of better heating, ventilating, and air conditioning, only by trial and error or by experience, our market expansion is going to be painfully slow. The average person knows when he is comfortable, but he does not know what conditions he should have to make him healthy or improve his efficiency. Today we do not have sufficient scientific information to prove conclusively the optimum conditions for health, comfort, and efficiency.

Our Society has done pioneer work in some of these fields and it, therefore, has a great opportunity through our research facilities to develop the information that is needed to benefit the public and to broaden the requirements for our services. In order to do this, we must have an extensive and comprehensive research program on physiological reactions.

We cannot do this through engineering research alone. Through physiological research the Society can establish the human needs and then the industry, through promotion, can create a public desire to have those needs fulfilled. We then will need engineering research to develop the fundamental principles and basic data necessary for designing proper equipment and better systems to meet the public's demands.

Publicize Results

The results of Society research and the findings and developments of others must be explored, explained, and disseminated to those who will use them for public benefit. The Society can do this through its various publications and at our Society and chapter meetings. Our past record of accomplishment in carrying on these activities would indicate that we are capable of attaining our objectives.

We must be alert to the progress, expansion and diversification that is taking place in the arts and sciences with which we are especially concerned and particularly in the allied arts and sciences. Air conditioning is captivating the imagination of the public. Industrial ventilation and air pollution are receiving much more attention by our profession. The types of construction and the building materials used are being given more careful consideration when designing the heating, ventilating and air conditioning systems of buildings. Many of our problems involve not only engineering science but physiological and psychological sciences as well. In every way our work is becoming more technically complex.

The Reward

We must understand our objectives, realize their possibilities, and believe in them. We must maintain our own optimism and enthusiasm and inspire others. Only in this way can we accomplish our objectives.

The problems that must be solved are not simple, and they will tax our skills, ingenuity, imagination, perseverance, and patience. The challenge is great, but the rewards are greater. If we had to describe in one word our future, we would define it as O-P-P-O-R-T-U-N-I-T-Y.

It has been a pleasure to serve as your President during this past year. This privilege has filled me with enthusiasm regarding our opportunities and our future and makes me feel very keenly about their possibilities. My optimism is further increased by the fact that we have many capable and sincere men, working their way through chapter offices and various Society Committees, who someday will make excellent officers and members of Council for our Society. These men will stimulate the Society to further progress by their foresight and imagination just as in the past many other members have been responsible for the fine accomplishments of the Society in its six decades of service.

Cordially yours,

L. N. Hunter

PRESIDENT

What Causes Noise in Oil and Gas Furnaces?

By T. H. Smoot*,
Adrian, Mich.

The American Society of Heating and Air-Conditioning Engineers, Inc. is engaged in the laboratory phase of a research project to determine the nature of the pulsations and oscillations in oil- and gas-fired domestic furnaces and boilers and to find methods for the elimination or suppression of such pulsations and oscillations. This phenomenon, as it occurs in gas-fired heating equipment, is commonly referred to as resonance, whereas pulsation has been the term generally used to describe the condition when it is associated with oil fires.

It was three years ago when initial steps were taken toward making this project a reality. It was included in a list of proposed projects that was mailed to the full Society membership for voting on the projects to be selected for the Society's long-range research program. The returns placed this project near the top in importance with the result that it was adopted by the Society as a major project and assigned to the Technical Advisory Committee on Combustion.

The initial work was pointed toward determining what the scope of such an investigation should be, and an effort was made to develop a comprehensive program for carrying out the investigation, including an initial literature survey and a detailed outline of the items of work to be done in the Laboratory. Out of this effort came the conclusion that the research should be of a very basic nature and involve a study of the physical and chemical processes taking place in the flame zone. There also came from this effort the determination of the facilities with respect to both personnel and equipment that must be possessed by the research organization, and the decision was made that the work should be placed with an outside research facility rather than with the Research Laboratory of the American Society of Heating and Air-Conditioning Engineers, Inc.

Where to Do; Who to Sponsor

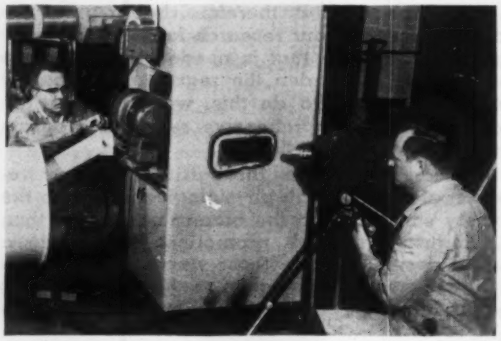
A search was made, therefore, for an outside research facility which possessed the special qualifications that would be required for successfully working with this project. In this search, many universities and commercial research organizations extending from New England into the Southern States and out into the Midwest were personally visited by committee members. This phase of the work not only helped to determine more fully the scope and nature of the research program but also gave a basis for estimating the probable time involved and the cost.

With completion of the foregoing work, a definite program for accomplishing the research had been developed and it was presented to the *American Gas Association* and *Oil Heat Institute* with invitations to join ASHAE in sponsoring the research. The problem of resonance in gas flames is considered to be of the same fundamental nature as pulsations in oil flames. *AGA* was desirous of having a basic study of the problem made as a means toward its possible solution and joined ASHAE as a sponsor. The interest of the oil heat industry in this program and its belief that it would bring valuable benefits caused them also to join us as a co-sponsor. This program is, therefore, being carried on under the equal sponsorship of *AGA, OHI,* and ASHAE. A Steering Committee under the TAC on combustion was formed to actively consult and guide in the carrying out of the research work, and this committee is composed of representatives from the three sponsors.

Progress to Date

Battelle Memorial Institute was selected as the research organization and the work was activated there on June 1, 1954. The initial phase of the work consisted of studies made of gas- and oil-fired boilers and furnaces in the laboratories of equipment manufacturers and in actual home installations. That phase has been completed and the second phase is now under way with equipment operating in the laboratories of *Battelle Memorial Institute* at Columbus, Ohio. Results to date indicate that flame stability is affected principally by conditions prevailing in the combustion zone and that the configuration of the system downstream of the combustion zone is of minor importance.

The program represents an expenditure of sizable research funds and is regarded as a program that may continue for several years. The opinion prevails that the expenditures involved are fully justified in relation to costs at the manufacturer, installer and user levels, and in consideration of the restrictions flame instability places on equipment design.



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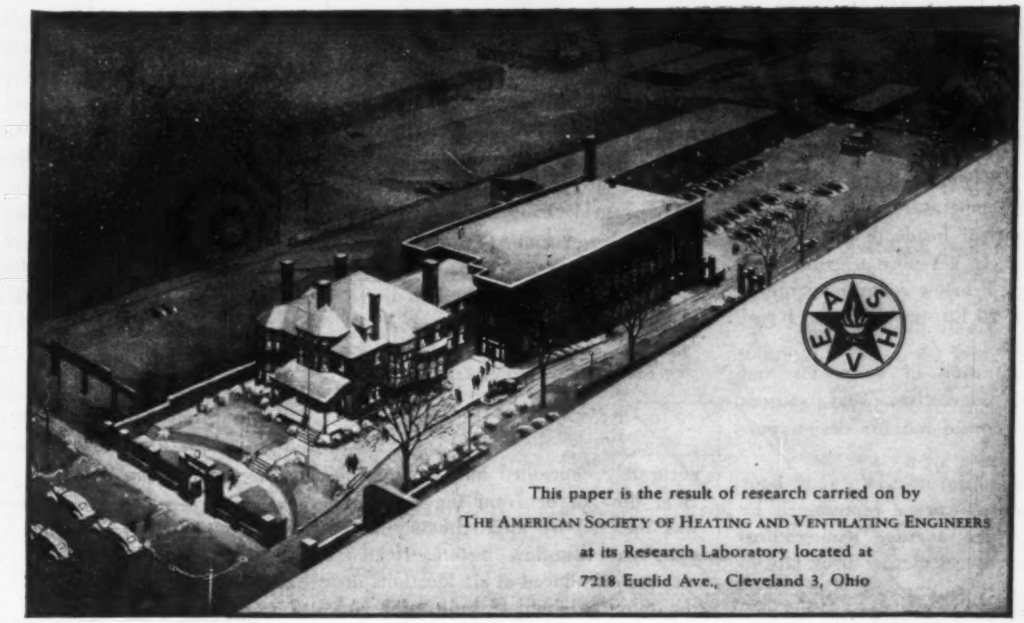
*Chairman, ASHAE Technical Advisory Committee on Combustion.



This paper is the result of research carried on by
THE AMERICAN SOCIETY OF HEATING AND VENTILATING ENGINEERS
at its Research Laboratory located at
7218 Euclid Ave., Cleveland 3, Ohio

Preliminary Studies of Heat Removal By a Cooled Ceiling Panel

By L. F. Schutrum*, John Vouris and T. C. Min***, Cleveland, Ohio**

SUMMARY — Heat removal from a room by a cooled ceiling panel was investigated, as was the temperature distribution in the cooled room.

Sufficient experimental observations were made in the Laboratory under steady-state conditions to prove that the heat transfer in a room cooled by a ceiling panel is comparable to that in a room heated by a floor panel (Inversion Principle). *Non-uniform* temperatures of the four walls and floor could be represented by an area-weighted average temperature (AUST).†

HEAT EQUIVALENT to one-half ton of refrigeration (6000 Btu per hr) can be removed from a living room of normal size by a cooled ceiling panel alone, operating only 10 deg below room temperature. This fact has been demonstrated by experimentation in the ASHAE Environment Laboratory under the research program planned by the TAC on Panel Heating and Cooling.

The program will supply reliable design data for panel-cooling systems. Such systems are becoming increasingly popular. Although this is not the final report on the subject, it does give information on factors that are important in design and those which are not.

Following the completion of the studies of panel heating, an investigation of space cooling by cooled ceiling panels was started. The complete panel-cooling program, as outlined by Group B‡ of the TAC on Panel Heating and Cooling, includes four phases. The first, which is the subject of this paper, is concerned with the heat exchanges that take place in a ceiling panel-cooled space under various conditions of surface temperatures, infiltration and furnishings; but does not include the effects of the introduction of conditioned air, luminaires, or solar energy. In the second phase, now in progress, heat-transfer relationships in a room cooled by a combination of a cooled ceiling panel and conditioned air are being studied. The third and fourth phases will include the modifying effects of luminaires and solar radiation on panel performance.

The final report on the panel-cooling program will probably be presented soon after mid-year 1955.

Conclusions

1. Ceiling-panel cooling is an inversion of floor-panel heating, and the performance of a cool ceiling panel can be predicted from the performance of a warm floor panel.

2. An appreciable amount of sensible heat can be removed from a

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**Former Assistant Research Engineer, ASHAE Research Laboratory.

***Research Engineer, ASHAE Research Laboratory. Junior Member of ASHAE.

For presentation at the 61st Annual Meeting of the AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS, INC., Philadelphia, Pa., January 1955.

†AUST signifies Average Uncooled Surface Temperature.

‡Group B — Heat Transfer between the Panel and the Space: J. M. van Nieukerken, Chairman; C. O. Mackey, Vice Chairman; C. M. Ashley, W. P. Chapman, W. S. Harris, Linn Helander, E. S. Howarth, A. T. Jorn, C. F. Kayan, H. A. Lockhart, W. E. Long, R. L. Maher, R. A. Miller, D. L. Mills, G. L. Wiggs.

room by a cooled ceiling panel, the surface temperature of which is above normal inside dew-point temperatures. In a typical test a ceiling at 10 deg F below room temperature absorbed 20 Btu per (hr) (sq ft) of ceiling area.

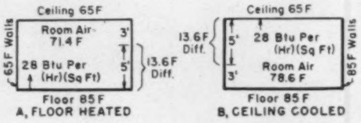
3. Infiltration of warm air and internal, convective, heat sources must be considered for design purposes.

4. Non-uniform wall and floor temperatures can be represented by area-weighted average temperatures (AUST) in calculating heat pickup by a cooled ceiling.

5. Room furnishings can be neglected as they affect the heat pickup by only approximately 5 percent.

Test Equipment and Conditions

Tests were made in the ASHVE Environment Laboratory, which was constructed several years ago for the study of heat transfer within a panel-heated or panel-cooled space. This room is 24.6 ft long, and 12.2 ft wide. For all tests reported in this paper, the adjustable ceiling was at a height of 8 ft. The temperatures of all six surfaces of the room were accurately controlled and measured. Heat flow to or from the surfaces was metered by approximately 150 plate-type heat-flow meters. Heated air was introduced at six locations in the room to simulate infiltration. A detailed description of the construction and instrumentation of the room is given in an earlier paper.[1]



A, FLOOR HEATED
B, CEILING COOLED

Fig. 1—Inversion principle

Tests were made with various combinations of panel surface temperature, wall and floor temperatures, and infiltration air quantity and temperature. In some cases, the four walls and the floor were maintained at the same temperature, thus creating a *uniform environment* while in other tests, *non-uniform environments* were created by holding the floor and various parts of the walls at different temperatures. In a few tests, windows were simulated by heating certain 4 x 5 ft panels to a temperature somewhat higher than that of the adjoining wall surfaces. Non-uniform environments were also obtained by neither heating nor cooling a certain area, but permitting it to seek its own equilibrium temperature. Such an area is referred to as a *neutral* surface.

Most tests were made with the room empty; but a few tests were made with room furnishings, and in several others, convection-type heaters were placed in the room.

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[1] Exponent numerals refer to References.

Table 1—Room Air Temperatures and Heat Removal by Cooled Ceiling Panel
(24½ x 12 x 8 FT High Room)

General Test Description	Test No.	Room Surface Temperature, F						AUST[a]	Infiltration		Heat Removal by Panel Btu/(hr) (sq ft)		Room Air Temperature, F			
		Ceiling	Floor	North Wall	South Wall	East Wall	West Wall		Changes per hr	Temp. F	Observ.	Calculated[b]	Observed		Calculated[b]	
													30 in.	5 ft.	30 in.	5 ft.
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Uniform Environments	281	65.6	92.6	89.9	92.0	92.8	92.5	92.2	None	—	39.0	38.0	83.7	83.9	83.7	83.6
	282	64.7	84.9	83.9	85.6	85.1	85.6	85.1	None	—	28.5	28.0	79.0	78.6	78.6	78.5
	363	59.5	85.3	82.7	85.2	85.3	85.1	85.0	None	—	35.0	35.5	77.8	77.2	76.8	76.8
	364	68.9	86.6	84.8	86.7	86.8	86.7	86.5	None	—	24.5	24.5	81.4	81.3	80.9	80.8
	365	78.9	84.7	84.3	84.9	85.8	84.9	85.0	None	—	8.0	8.0	83.2	83.2	83.0	83.0
	366	69.2	84.8	83.9	85.7	86.2	85.7	85.3	None	—	22.0	22.5	80.8	80.3	80.1	80.1
	367	69.4	84.8	83.3	85.0	86.0	85.0	85.0	None	—	21.0	21.5	80.5	80.5	80.0	80.0
	368	59.3	70.0	69.4	70.0	70.2	70.0	70.0	None	—	13.0	14.0	66.7	66.6	66.6	66.6
	369	60.2	79.8	77.9	79.8	80.1	79.8	79.7	None	—	25.5	26.0	73.5	73.3	73.5	73.4
	370	58.5	105.2	102.0	104.7	105.2	104.6	104.7	None	—	69.0	72.5	91.2	90.6	89.9	89.8
	371	69.3	104.7	100.7	104.7	105.1	104.5	104.3	None	—	55.0	53.5	94.3	93.3	93.1	93.0
	372	69.8	95.0	92.3	95.2	95.4	95.1	94.9	None	—	36.0	37.0	87.4	87.0	86.9	86.8
	283	64.9	86.0	83.9	85.7	84.8	85.6	85.4	1.0	110.2	30.5	30.5	80.7	80.3	80.2	80.1
	391	70.0	84.1	83.7	84.2	84.9	84.1	84.2	1.05	110.0	21.0	21.0	80.7	80.6	81.0	80.9
	392	70.3	85.2	84.2	84.9	84.1	84.7	84.7	1.9	110.2	23.0	23.0	82.5	82.6	82.9	82.6
	393	70.7	85.2	84.5	85.2	85.2	85.0	85.1	2.9	110.2	24.0	23.5	84.0	83.8	84.6	84.2
	387	69.8	84.4	83.9	84.7	84.6	84.6	84.5	1.0	79.6	19.5	20.5	79.7	79.7	79.3	79.3
	388	69.8	84.2	83.9	84.7	84.6	84.7	84.4	1.9	80.2	20.5	20.0	79.8	79.5	78.8	78.9
	389	70.2	84.7	84.1	84.8	84.8	84.8	84.7	2.9	80.2	19.0	20.0	80.1	79.7	78.5	78.8
Non-Uniform Environments																
One long wall hot, all others 85 F ..	394	70.0	85.1	84.8	84.9	108.8	85.0	90.3	None	—	29.0	28.5	84.3	84.3	83.8	83.8
	395	70.2	85.2	84.9	85.1	108.6	85.0	90.3	1.0	110.0	30.5	29.5	85.4	85.4	85.1	84.9
One long wall hot, 3 walls & floor neutral	396	70.5	90.6[d]	101.2[a]	100.7[d]	109.2	101.0[d]	99.3	None	—	41.0	42.5	90.6	90.6	90.1	90.0
	397	69.9	79.0[d]	82.6[d]	82.0[d]	85.0	82.1[d]	81.7	None	—	15.0	16.0	78.0	78.4	77.9	77.9
3 simulated windows 110 F[c], 2 simulated outside walls, floor and 2 walls neutral	398	69.6	80.2[d]	80.2[d]	89.6[d]	89.5	80.6[d]	83.4	None	—	19.0	19.0	79.0	79.0	79.0	79.0
	399	64.5	77.8[d]	77.6[d]	89.5[d]	89.6	78.3[d]	81.8	None	—	23.0	23.5	76.7	76.7	76.3	76.2
	400	65.1	81.0[d]	80.8[d]	89.5[d]	89.5	80.8[d]	83.7	1.0	109.5	27.0	27.5	79.5	79.5	79.2	79.0
Room Furnished	401	64.7	77.5[d]	76.8[d]	89.3[d]	89.3	77.4[d]	81.3	None	—	21.5	23.0	76.6	76.4	77.2	77.2
	402	64.4	80.8[d]	79.6[d]	89.5[d]	89.3	79.9[d]	83.3	1.0	109.3	27.0	27.5	78.8	79.1	78.7	78.5
	403	64.8	85.0	83.7	84.8	84.7	84.7	84.7	None	—	25.5	27.5	79.1	78.4	78.3	78.3
Internal heat sources																
One KW	404	69.4	84.8	84.0	83.7	84.6	84.6	84.5	None	—	26.0	—	82.7	82.7	—	—
Two KW	405	69.8	84.8	84.4	84.9	84.8	84.8	84.8	None	—	30.5	—	85.0	85.0	—	—
Three KW	406	69.9	84.8	85.0	84.9	85.1	84.8	84.9	None	—	37.0	—	87.7	87.7	—	—

[a] Area weighted average temperature of the floor and walls.
[b] Calculated by the inversion principle for a uniform environment having floor temperature listed in col. 9 and AUST listed in col. 3.
[c] One 4x5 ft window in center of south wall. Two 4x5 ft windows in east wall.
[d] Neutral surface, neither heated nor cooled by liquid circulation.

Tabulations of Observations and Calculations

The results of tests, all of which were made under steady-state conditions, are given in Table 1. A general description of the environment during each test is given in Column 1, and test numbers are given in Column 2. The average surface temperatures of the cooled ceiling panel, and of the floor and each of the four walls, are listed in Columns 3 to 8 inclusive.

The average uncooled-surface temperatures (AUST) listed in Column 9 are the area-weighted average temperatures of the floor and the four walls. The amount and temperature of the infiltration air are given in Columns 10 and 11.

The observed rates of heat transfer to the ceiling panel are listed in Column 12, and the observed air temperatures at the 30-in. and 5-ft levels are given in Columns 14 and 15. For comparison with these observed values, calculated heat transfer rates and temperatures are listed in Columns 13, 16, and 17. These values were calculated from the results previously reported on floor-panel heating[2] by assuming a complete inversion of conditions.

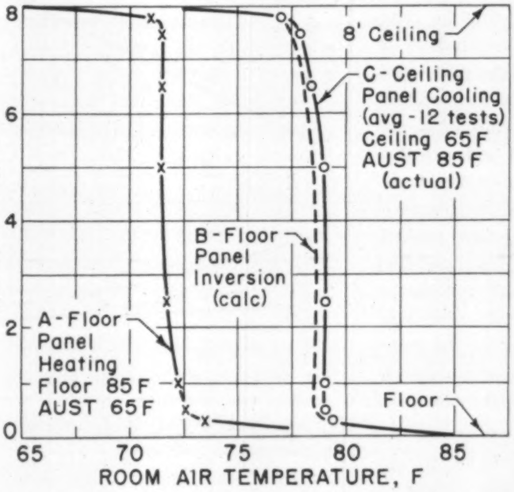


Fig. 2—Room air temperature gradients for cooled ceiling panels and heated floor panels; uniform environment, no infiltration, 24½ x 12 x 8 ft high room

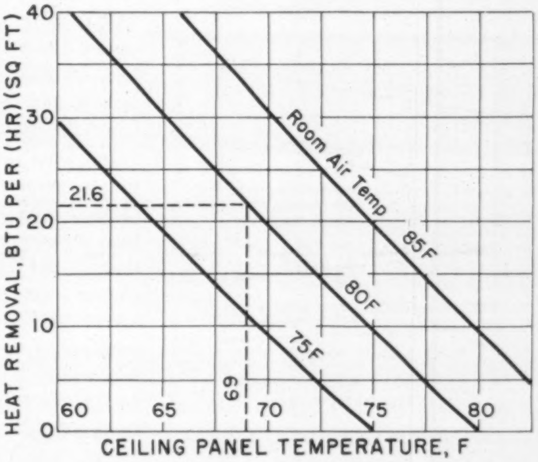


Fig. 3—Performance of a cooled ceiling panel, uniform environment, no infiltration, no internal heat sources

Discussion of Results

Inversion Principle. Theory suggests that convection heat transfer, as well as radiation exchange, in a room with a cooled ceiling panel, should be the same as in a room with a heated floor panel, if the temperatures of the ceiling panel and the surrounding surfaces of the cooled room are respectively the same as the temperatures of the surrounding surfaces of the heated room and the heated floor panel. Furthermore, the difference in temperature between the cooled ceiling panel and the room air should be the same as between the heated floor panel and the room air.

The inversion principle is illustrated in Fig. 1. Room A of Fig. 1 shows a heated floor panel at 85 F, and ceiling and walls at 65 F. For these surface temperatures, previous research[2] has indicated that the room-air temperature at the 5-ft level would be 71.4 F, and the heat output of the floor panel would be 28 Btu per (hr) (sq ft). An inversion of this condition is shown in Room B of Fig. 1. Here the surface temperatures of the cooled ceiling and the walls are 65 and 85 F respectively, and the heat pickup by the cooled ceiling panel would be 28 Btu per (hr) (sq ft). The difference between the temperatures of the heated floor panel and the air in Room A, 5 ft above the panel, is 13.6 F, and this same difference in the temperature between the cooled ceiling panel and the air would indicate an air temperature of 78.6 F in Room B 5 ft below the panel.

The calculated values of heat pickup by the cool-ceiling panel, listed in Column 13 of Table 1, are in good agreement with the observed values shown in Column 12. Similarly, the calculated air temperatures at the 30-in. and 5-ft levels, given in Columns 15 and 17, agree well with the observed temperatures in Columns 14 and 16. This close agreement demonstrated the feasability of calculating the performance of a cooled ceiling panel from previously determined data on floor-heating panels. It was therefore possible to materially reduce the number of tests which would otherwise have been necessary to completely determine the heat-removal capacity of cooled ceiling panels.

Air-Temperature Gradients: Room-air temperature gradients for uniform environment and no infiltration are small, as shown in Fig. 2. Curve A is the gradient which would exist[2] in a floor-panel-heated room with 85 F floor temperature and 65 F AUST. Curve B is the temperature gradient which would be predicted from Curve A by the inversion principle for a ceiling-cooling panel at 65 F and 85 F AUST. The air temperatures indicated at the 4 ft height by Curves A and B are 13.5 F below the heated-floor temperature and 13.5 F above the cooled-ceiling temperature, respectively. The air temperatures observed with a cooled ceiling panel are shown in Curve C. These are only slightly higher than the values shown by Curve B.

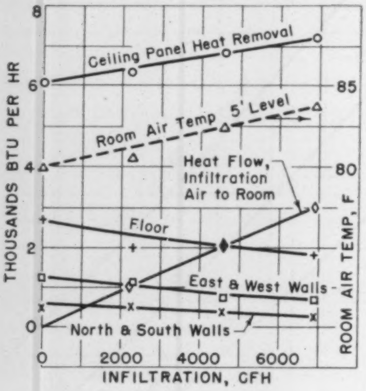


Fig. 4—Effect of infiltration on heat flow and room air temperature; ceiling 70.5 F, AUST 85 F, infiltration air 110 F, uniform environment, 24½ x 12 x 8 ft room (one air change per hour = 2400 cfh)

Cooling Performance: The performance of a full ceiling panel in effectively cooling the 24.6- x 12.2-ft room is shown graphically by Fig. 3. The directrix shows that a ceiling panel at 69 F will remove 21.6 Btu per (hr) (sq ft) from a room which has an air temperature of 80 F. The ceiling area was 300 sq ft and the total heat pick-up was 6480 Btu per hr. All of the heat absorbed by the panel entered the room by conduction through the walls and the floor.

It should be noted that the AUST, not included in Fig. 3, is related directly to the panel temperature, and the room air temperature. The relationship between AUST, panel temperature, and panel pickup was not shown because it would have been the same as Fig. 1 of reference 2 except for the inversion — the AUST of the figure becomes the cooled-panel temperature, and the floor temperature becomes the AUST.

Factors that Must be Considered in Design

Effect of Infiltration: Fig. 4 shows graphically the effects of varying quantities of infiltration air at 110 F, with a fixed ceiling temperature and AUST. Warm air infiltrating the room caused the room air temperature to rise, increased the ceiling panel-heat pickup, and reduced the flow of heat from the floor and walls into the room. Data in Table 1 indicate that the magnitude of these effects decreased with reduction in temperature difference between the infiltration air and the AUST. No significant changes were found with infiltration air at 80 F. In most tests, the temperature of the air leaving the room was within 1 deg of the air temperature at the 5-ft level at the center of the room.

The changes in panel-heat pickup and room air temperature caused by infiltration are of the same magnitude as those found in a floor-panel-heated room for the same infiltration rate and temperature difference between the infiltration air and AUST (see Fig. 3 of reference 2). Good agreement between the observed values and those calculated by inversion is shown in Table 1 for tests with infiltration.

Effect of Low-Temperature Heat Sources: The effect of low-temperature convective heat sources, such as motors and people, on the performance of a cooled ceiling panel was studied by placing 500-watt electric heaters in the otherwise empty room. Each heater consisted of a 500-watt incandescent lamp placed inside vertical, concentric 8-in. and 10-in. galvanized ducts 2 ft long and baffled at both ends. The heaters were mounted about 1 ft above the floor. The temperature of the outer cylinders was less than 100 F and calculations indicated that at least 95 percent of the total output of the heaters was by natural convection.

Tests were made with a uniform environment of 85 F AUST, 70 F ceiling temperature, no infiltration, and with two, four, or six of the heaters in operation. The effects of the internal heat sources on heat flow and air temperature are shown in Fig. 5. The top curve of the figure indicates that the heat pickup by the cool-ceiling panel increased by 50 percent of the heater output. The air temperature at the 5-ft level increased, and at the higher internal loads was higher than the controlled AUST. Because of the increased air temperature, heat flow from the floor and wall surfaces decreased, and above approximately 9000 Btu per hr internal load, the heat exchange at the wall surfaces reversed direction.

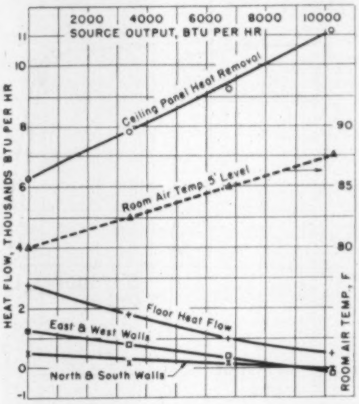


Fig. 5—Effect of convective heat source on heat flow and room air temperature; ceiling 70 F, AUST 85 F, uniform environment, no infiltration

The heaters in the room produced localized, turbulent, convection currents and large temperature gradients. Directly over the heaters, air temperatures of approximately 110 F were measured while the general room temperature was about 85 F. Because of this turbulent condition, the curve in Fig. 5 of room-air temperature at the 5-ft level may not represent the true average temperatures.

Because of the similarity between Fig. 4, showing the effect of infiltration, and Fig. 5, the effect of internal heat loads, further comparisons were made. It was found that the additional heat picked up by the ceiling panel was essentially the same, whether it was caused by an internal convective heat source or by infiltration air introduced at the same temperature as the air leaving the convective source.

Factors That Can be Neglected in Design

Effect of Non-Uniform Environment: It was shown in an earlier paper[3] that the performance of a panel-heating system in a space having a non-uniform environment could be predicted with satisfactory accuracy on the basis of the AUST of the space. The close agreement between observed and calculated heat transfer rates and air temperatures shown in Table 1 suggests that this relationship is also true for the panel-cooling systems.

Effect of Room Furnishings: As indicated in Column 1 of Table 1, several tests were made with room furnishings, consisting of a davenport, five office chairs with leather backs and seats, one large table, and two end tables. This amount of furniture was judged to be representative for a living room of comparable size. The temperatures of the furniture, as measured on the table tops, and seats and backs of chairs, were about the same as the room air temperature and thus lower than the AUST. The ceiling panel was therefore *seeing* a lower temperature environment than with empty room conditions, and consequently, the heat pickup by the panel was less. The reduction averaged about 5 percent, which is about the same as the reduction in the output of a heated floor panel caused by a like amount of furniture in earlier tests.[3]

Effects of Non-Uniform Panel Temperature: One test was made with only a part of the ceiling area cooled. The temperature of the uncooled sections was not controlled, but was the equilibrium temperature resulting from heat exchange with other room surfaces and the room air, heat gain or loss from the rear of the panel, and conduction from piping and adjacent panel sections. The area-weighted average rate of heat removal from the entire ceiling was essentially the same as the calculated heat removal based on the area-weighted average ceiling surface temperature. The observed room-air temperature agreed well with the air temperature calculated by the inversion principle when using the same average temperature of the entire ceiling. An earlier paper[4] indicated similar performance for heated floor and ceiling panels at non-uniform panel temperatures.

Future Research

Additional experimentation with other sizes of rooms, and other types of internal heat sources would be desirable to develop general design formulas. Conditioned air, electric lighting, and solar energy are factors which have not been *included* but which are important to air conditioning. Consequently, the second phase of the overall research program, now in progress, will measure the effect of conditioned air on the performance of a cooled ceiling panel. The third and fourth phases cover the modifying effects of luminaires and solar radiation which are important air conditioning loads.

References

1. ASHVE Research Report No. 1444 — The ASHVE Environment Laboratory, by Cyril Tasker, C. M. Humphreys, G. V. Parmelee and L. F. Schutrum (ASHVE Transactions, Vol. 58, 1952, p. 139).

2. ASHVE Research Report No. 1473 — Heat Exchanges in a Floor Panel Heated Room, by L. F. Schutrum, G. V. Parmelee, and C. M. Humphreys (ASHVE Transactions, Vol. 59, 1953).

3. Effects of Non-Uniformity and Furnishings on Panel Heating Performance, by L. F. Schutrum and C. M. Humphreys (ASHVE Journal Section, *Heating, Piping & Air Conditioning*, February 1954, p. 131).

4. Effects of Room Size and Non-Uniformity of Panel Temperature on Panel Performance, by L. F. Schutrum and J. D. Vouris (ASHVE Journal Section, *Heating, Piping & Air Conditioning*, September 1954, p. 133).

PROCEEDINGS OF SPECIAL MEETING
November 22, 1954

Pres. L. N. Hunter called the special meeting of the Society to order at 2:00 p.m. in the Washington Room of Hotel Statler, New York, N.Y. There were ten members present.

He advised that the meeting had been called to count the votes on the proposal to change the name of the Society from The American Society of Heating and Ventilating Engineers to American Society of Heating and Air-Conditioning Engineers, Inc.

Notice of the proposed change was sent to all members together with proxy ballots for those members eligible to vote.

On motion of P. B. Gordon, seconded by A. J. Offner, it was VOTED:

> That the name of The American Society of Heating and Ventilating Engineers be changed to American Society of Heating and Air-Conditioning Engineers, Inc., and that the officers be, and hereby are, authorized and directed to file an appropriate certification of change of name.

The four proxies, L. N. Hunter, W. L. Fleisher, A. J. Offner and P. B. Gordon, cast 3,278 votes in favor, 654 against the motion. Two members present voted in person.

The report of the tellers, W. J. Olvany, C. H. Hiers, W. M. Heebner and J. C. Fitts, *chairman*, was presented by Mr. Fitts.

In favor of the name change, 3,280; opposed, 654; ineligible, 76; illegible signatures, 69; unsigned proxies, 2. President Hunter stated that the eligible voting membership of the Society numbered 5,919 and 2,961 votes were required for a majority. As the affirmative vote was in excess of this number, namely 3,280, he declared the motion passed.

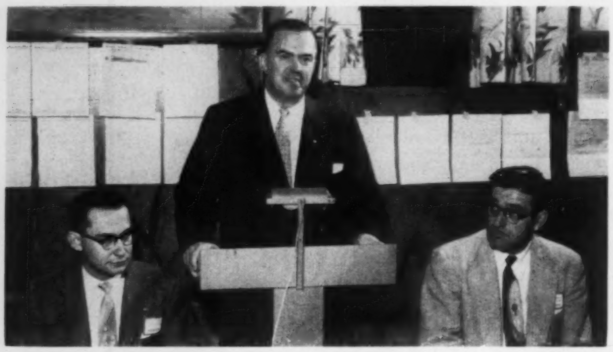
The meeting was adjourned at 2:20 p.m.

Summary of Chapter Meetings*

Colonels Form 59th Chapter

With almost 100 members and guests in attendance, the Bluegrass Chapter of the ASHAE was officially chartered in Louisville, Ky. on November 18, 1954.

Following the dinner, J. W. May presided at the business meeting and introduced Pres. L. N. Hunter who presented an excellent talk on *The Aims and Activities of* ASHAE. He outlined the Society's growth and its objectives, and its part in the improvement of human health and comfort. He also discussed the importance of the individual member and the role of the chapters in the Society.



L. N. Hunter, president of ASHAE, addressing the Bluegrass Chapter of the Society at its Charter meeting with H. L. Carr (left) and A. E. Hausmann (right).

A welcome into the Society's family of chapters was extended by B. L. Evans, St. Louis, Mo., member and former chairman of the Chapter Relations Committee.

A. W. Edwards, member of Council, Cincinnati, Ohio, brought greetings from the Council and his Chapter. Members representing the Indiana and Delta Chapters were also in attendance.

Presentation of the Charter on behalf of the Council was made by President Hunter to Mr. May.

Mr. Evans conducted the election and installation of the officers, who are: *President* — J. W. May; *Vice President* — W. M. Pace; *Treasurer* — R. B. Duggan; *Secretary* — A. E. Hausmann; *Board of Governors* — H. L. Carr, W. J. Killian, and H. A. Zanone.

The Chapter Secretary record books were presented to Mr. Hausmann by Executive Secretary A. V. Hutchinson.

The meeting adjourned at 10:00 p.m.

- *ARIZONA*: The nominating committee presented a slate of officers for 1955 in October. President V. J. Carns was elected member of the Chapters Conference Committee, with the president to be elected in December to serve as alternate.

J. D. Loveley, chief engineer, Airtemp Division, Chrysler Corp., Dayton, Ohio, discussed the development and design of air-cooled refrigerated air-conditioning systems.

- *ARKANSAS*: A comprehensive discussion of *Centrifugal Refrigeration Machines* was given by H. W. Walling, York Corp., Memphis, Tenn., at the November meeting.

ASHAE Pres. L. N. Hunter, Johnstown, Pa., presents Bluegrass Charter to J. W. May, president of newly chartered chapter. (*l.* to *r.*) W. J. Killian, member of board of governors; O. J. Hill, program chairman; A. V. Hutchinson, executive secretary of ASHAE, and his assistant, D. T. Donovan; Mr. May; A. E. Hausmann, secretary; President Hunter; W. M. Pace, vice president; R. B. Duggan, treasurer; H. A. Zanone and H. L. Carr, members of the board of governors

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*Note: The attendance ratios shown represent the membership attendance divided by the chapter membership. These ratios will be useful as a partial indication of interest shown by local chapter members in various types of subjects programmed by the various chapters and may be useful in deciding on subjects for chapter meetings.

Elected to the Chapters Conference Committee were J. W. Thompson, member, and W. A. Bullard, alternate. Attendance 30. Attendance ratio 0.27.

• *ARKANSAS*: First Vice Pres. J. E. Haines, Minneapolis, Minn., spoke in October on the history and future of the heating and air-conditioning industry. In his talk entitled *The Next Ten Years,* Vice President Haines gave an encouraging report of increased markets over the past 10 years, as well as an optimistic forecast, indicating a tremendous potential for the air-conditioning industry during the next 10 years. Attendance 33. Attendance ratio 0.34.

• *ATLANTA*: S. W. Boyd introduced First Vice Pres. J. E. Haines, Minneapolis, Minn., who addressed the November meeting on *The Next Ten Years*. Vice President Haines mentioned new work being done at the ASHAE Research Laboratory on odors and solar heat, and new tests on worker efficiency in air-conditioned spaces. Attendance 51.

• *ATLANTA*: The guest speaker in October, Henry Wright, Herman Nelson Division, American Air Filter Co., Inc., Louisville, Ky., talked on *Heating Research at the Laboratory School.* Mr. Wright was introduced by S. L. North. Pres. J. M. Lazenby presided. Attendance 44.

• *BALTIMORE*: An inspection tour of the Army Chemical Center, Edgewood, Md., was held in November in conjunction with the Washington, D. C. Chapter, ASHAE, and the Baltimore - Washington Section, *ASRE*. Brig.-Gen. J. R. Burns, commanding general of the installation, discussed the functions of the various divisions at the Center. Paul Bales, Chemical Corps Medical Laboratories, and S. Y. Smith, president, S. Yeardley Smith, Inc., Baltimore, gave a technical presentation on climatic chambers for physiological studies.

Following the inspection tour and dinner, Warren Viessman, Chemical Corps Engineering Agency, presented a technical paper covering atmospheric control and protective shelter.

• *BALTIMORE*: Prof. E. R. Queer, State College, Pa., treasurer of ASHAE, gave an enlightening talk at the October meeting on the preservation of military material and cold storage of foods by utilizing existing caves. Limestone caves, Professor Queer stated, were used by our government for partial storage of military material and machine tool equipment after the Korean war, and by the German Army for storage and war production during World War II.

Regional Meeting Planned for Oklahoma City April 14

A Regional Meeting of the Society will be held April 14-16, 1955 in the Skirvin Hotel, Oklahoma City. W. J. Collins, Jr., is general chairman of the Committee on Arrangements.

The meeting will be held in conjunction with the Spring Meeting of the Council of the Society. Three papers will be presented at the technical session, and the Regional Meeting will be concluded with a dinner.

Unanimous approval elected Pres. E. H. Taze as member, and E. J. Morris as alternate to the Chapters Conference Committee.

• *BRITISH COLUMBIA*: Three November guest speakers offered a panel discussion on the cost of heating and ventilating systems today. The various phases of architecture covered were *Commercial Buildings* by Fred Brodie, *Residential Design* by Ron Thom, and *Institutional Types of Buildings* by Roy Jesseman; all are members of the firm, Sharp & Thomson Berwick Pratt, and were introduced by C. W. Leek.

M. E. Minaker presented a past president's pin to Mr. Leek in appreciation for his excellent work while in office. Attendance 51. Attendance ratio 0.57.

• *CENTRAL NEW YORK*: At the November meeting C. A. McKeeman, director, Heating and Cooling School, American Radiator & Standard Sanitary Corp., Buffalo, N. Y., spoke on fan coil heating and cooling systems. He was introduced by W. G. Hann. Questions posed by the audience indicated considerable interest in the topic.

• *CENTRAL NEW YORK*: Society Pres. L. N. Hunter, Johnstown, Pa. spoke on the *Rating of Heating Boilers* in October. L. A. Childs, program chairman, introduced President Hunter.

F. E. Krell installed the new officers. After accepting the gavel and assuming the presidency of Central New York Chapter, F. D. Putnam called upon Mr. Krell to present the past president's pin to C. R. Acheson, outgoing president.

• *CENTRAL OHIO*: Silent tribute was paid to A. W. Williams, deceased member of the Society. A letter of appreciation was sent to Mrs. Williams by N. T. Hess.

Two excellent talks on air conditioning were featured at the October meeting. R. C. Liebert, president, Capitol Refrigeration Co., Columbus, devoted himself to the *Future of Air Conditioning*, and Emily Stulka reported on the *Economics of Air Conditioning*. Attendance 49. Attendance ratio 0.31.

• *CINCINNATI*: *A Is for Atom* was the title of a film shown at the November meeting. Following was an interesting talk by J. W. Stribling, engineer, Development Operations, General Electric Co., Cincinnati, on *Air Conditioning for Supersonic Planes.* Lively discussion ensued.

A. W. Edwards, a member of the Society's Council, read a letter from the new Bluegrass Chapter, Louisville, Ky., inviting Cincinnati Chapter members to its charter dinner. Attendance 55.

• *CONNECTICUT*: Increased membership was urged by Pres. C. L. L'Hommedieu at the November meeting with a request that each member try to add a new member.

John Crosby, Johnson Service Co., spoke on temperature controls, particularly describing the control of air delivery on the system installed in the John Hancock Life Insurance Co., Boston. Attendance 81.

• *CONNECTICUT*: J. D. Pierce introduced Pres. L. N. Hunter, Johnstown, Pa. who spoke on *The Rating of Heating Boilers,* covering cast iron and steel boilers.

Also at the October meeting, nominations were made from the floor for the nominating committee's selections for the coming year. Committee members are D. M. Hummel, Fritz Honerkamp, R. J. Pinto, H. A. Thomas and R. B. Cahoon. Attendance 51.

• *DELTA*: Electronic controls were thoroughly discussed and explained by three speakers in November. Theodore Offner, technical papers chairman, introduced R. K. Goode and J. S. Adair, both of James S. Adair, Sales Engrs., New Orleans, and William Fulton, Minneapolis-Honeywell Regulator Co.

Pres. C. V. Bankston complimented those responsible for the first issue of the *Delta News,* newborn Chapter periodical. Attendance 70.

• *DELTA*: The feature of the October meeting was First Vice Pres. J. E. Haines' informative talk on *The Next Ten Years.* Mr. Haines, of Minneapolis, Minn., gave a resume of the progress our nation and profession has made, and a prediction of continued successes and improvements in the future. Attendance 75. Attendance ratio 0.36.

• *EMPIRE STATE CAPITAL*: Vice Pres. G. G. Davis presided at the November meeting. Introduced by C. G. Estey, H. H. Yousoufian, research engineer, Air Devices, Inc., New York, N. Y. spoke on *Common Sense Approach to Modern Air Distribution Systems.* Mr. Yousoufian pointed out many of the new and approved methods of proper air distribution and the many pitfalls encountered by the air distribution engineer. Attendance 26. Attendance ratio 0.38.

• *GOLDEN GATE*: Business of the October meeting included the reading of committee reports and an announcement by Herb Duncan that a fund had been set up to handle the 1955 Semi-Annual Meeting.

Donald Portman gave an illustrated talk on the *Measurement of Heat Transfer in Micrometeorology.* Attendance 61.

• *ILLINOIS*: R. E. Hattis, consulting engineer, Chicago, outlined the ideal solution to the heating problem in his talk on *Forced Hot Water vs. Steam for Large Buildings.* Introduced in October by E. G. Avery, Mr. Hattis gave a factual resume of the properties of steam and hot water as heating mediums. After describing a variety of applications, he pointed out that analysis of several factors is necessary to establish the most suitable method.

Second Vice Pres. John W. James, Chicago, described the situation surrounding the proposed Society name change. The 1954-55 officers and board of governors were introduced by G. V. Zintel. Attendance 156. Attendance ratio 0.25.

• *INDIANA*: *Effective Methods of Improving Relations between Architects, Engineers and Contractors* was the subject of a panel discussion held on October 26. With R. I. Drum as moderator, David Burns spoke for architects; T. R. Davis, for engineers; Wally Greer and O. E. Cotton, for contractors. As program chairman, J. M. Teskoski introduced the panel. Many members entered into the discussion. Attendance 65.

• *INDIANA*: The opening meeting of the season was postponed until October 8 in order to coincide with the quarterly meeting of the Society Officers and Council. All the Society Officers and Council members, together with W. J. Collins, Jr., chairman, Chapters Conference Committee, were introduced to the Indiana membership on this occasion by Chapter Pres. P. O. Patterson.

Society Pres. L. N. Hunter spoke on the importance of the kind of research being done by the Society. After Mr. Hunter's remarks, E. R. Kaiser, Cleveland, Ohio, director of research at ASHAE Research Laboratory, outlined some of the new research to be undertaken by the Society in cooperation with 10 universities.

Prof. W. T. Miller, Purdue University, West Lafayette, Ind., told of inadequacies and engineering lack in heating and air-conditioning installations he has seen in his travels throughout the country. President Patterson presented a past president's pin to R. C. Blackman. Attendance 115.

• *INLAND EMPIRE*: Some timely comments on natural gas burners were made in October by Robert Reed, John Zink Co., Tulsa, Okla., who spoke on oil and gas burners. Introduced by F. J. Lund, Mr. Reed concerned himself with the basic facts of combustion, the practicability of combination burners, and comparisons of coal, oil and gas combustion.

M. A. Clerc called attention to a 30 percent increase in attendance over the first meeting. Attendance 36. Attendance ratio 0.47.

John R. Allen Memorial Library

The ASHAE Committee on Research gratefully acknowledges the following gift to the John R. Allen Memorial Library, which is maintained at the Society's Research Laboratory, 7218 Euclid Ave., Cleveland 3, Ohio.

Proceedings of the National District Heating Association, Vol. XLIII, 1952, published by *National District Heating Association*, Pittsburgh, Pa. Gift of the *Association*.

The presentation of textbooks and pamphlets in the field of heating, ventilating and air conditioning and allied fields, by authors and others, will be welcomed by this library. Suitable book plates carry the name of the donor and date of the gift.

• *KANSAS*: Pres. Charles Yoe commented in October on improved meeting attendance and hoped for continued improvement.

A. B. Newton introduced H. H. Yousoufian, research engineer, Air Devices, Inc., New York, N. Y., whose talk was entitled *Common Sense Approach to Modern Air Distribution Systems*. This program included continuous strip, square, rectangular and circular diffusers, with particular reference to adjustable circular diffusers, and field testing of air diffusers. Attendance 43. Attendance ratio 0.46.

• *KANSAS CITY*: A Life Membership Certificate was presented to C. A. Weiss by Society Treas. E. R. Queer, State College, Pa. Mr. Weiss received congratulations from other Life Members present at the November meeting—E. K. Campbell, Henry Nottberg, Sr. and H. H. Wright.

Mr. Campbell introduced the guest speaker, Professor Queer, whose subject was air conditioning and dehumidification of caves used for the storage of machine tools and other equipment which deteriorates rapidly when exposed to high relative humidity. Attendance 93. Attendance ratio 0.36.

• *MANITOBA*: Second Vice Pres. John W. James, Chicago, Ill., advised the Manitoba members at the October meeting to *Give the Public What They Need*. The group's interest was indicated by several questions addressed to Vice President James following his talk. The guest speaker was introduced by W. J. Atkinson. Attendance 23.

• *MICHIGAN*: *High Temperature Water Heat Distribution Systems* were described in November by P. L. Geiringer, chief engineer, American Hydrotherm Corp., Long Island City, N. Y., introduced to the membership by D. S. Falk. Mr. Geiringer illustrated with slides the various types and features of high temperature water systems.

Since this was Student Branch Night, the members were addressed by Prof. J. E. Lay, University of Detroit; John Rumpf, president, University of Detroit Student Branch; and G. H. Williams, Student Branch adviser. Attendance 148.

• *MINNESOTA*: Congratulations were extended at the November meeting by Pres. J. A. Craig to J. H. Jester for an excellent job of getting the roster out early.

Minnesota Vice Pres. J. S. Locke introduced Society Pres. L. N. Hunter, Johnstown, Pa. President Hunter reported what local chapters can do about codes and gave an informative talk on *The Rating of Heating Boilers*. Attendance 108.

• *MISSISSIPPI*: Officers elected at the November meeting were as follows: *President*—J. E. Davis, Jr.; *Vice President*—J. W. Taylor; *Secretary*—L. H. Smith; *Treasurer*—J. W. Doggett, Jr.; *Board of Governors*—H. S. Thomas and F. L. Cooper.

Heating and Ventilating in Schools was the subject of a talk by C. S. Stock, manager, N.Y. sales department, American Air Filter Co., Inc., Louisville, Ky. H. M. Ludlow introduced Mr. Stock. Attendance 33.

• *MISSISSIPPI*: Optimistic predictions for developments in *The Next Ten Years* were given by First Vice Pres. J. E. Haines, Minneapolis, Minn. in October. Introduced by J. W. Taylor, program chairman, Vice President Haines also reviewed the progress made in the air-conditioning field in the last 10 years. Attendance 27.

• *NEBRASKA*: M. F. Stober introduced Jack Balmer, manager, Omaha Civic Auditorium, to the November audience. Both his managerial duties and the operational functions of the Auditorium were described by Mr. Balmer. A lengthy question period indicated general enjoyment of the topic. Attendance 16.

• *NEW YORK*: Visitors to the November joint *ASRE*-ASHAE meeting included George Werner, Copenhagen, Denmark, and H. C. Tiller, Prahran, Australia; both are Society members.

Albert Giannini, program chairman, introduced W. L. Fleisher, Sr., past president of the Society, who gave an informative presentation on *Design Standards for Comfort Air Conditioning*. Mr. Fleisher replied competently to questions raised by the members. Attendance 250.

• *NORTH JERSEY*: A standing round of applause followed Pres. L. N. Hunter's comprehensive discussion on *The Rating of Heating Boil-*

ers. President Hunter, speaking in November, anticipated that the 1955 Annual Meeting would be the largest in the Society's history.

Pres. H. M. Patrick introduced all the committee chairmen. Attendance 78.

• *NORTH TEXAS*: J. A. Ray introduced W. P. Glancy, district manager, Aerofin Corp., Dallas, who told those at the October meeting about the *Selection of Steam Coils.* Important phases of the problem were illustrated by *chalk talk.*

T. H. Anspacher reported that almost $600 had been raised for the Giesecke Memorial Fund, and D. C. Kieffer reported $359 collected for the Polio Fund.

• *NORTHEASTERN OKLAHOMA*: Second Vice Pres. John W. James, Chicago, proposed to the members at the November meeting that they *Give the Public What They Need.* He gave a highly interesting report on the predicted growth curve of the heating and air-conditioning industry.

Business of the meeting included the report of the nominating committee of the slate of officers for 1955, and an announcement of the Regional Meeting to be held in Oklahoma City next April. Attendance 33.

• *NORTHEASTERN OKLAHOMA*: W. H. Plowman, Goulds Pumps, Inc., Tulsa, demonstrated the *Proper Selection of Pumps for Air-Conditioning Applications.* Introduced at the October meeting by Pres. R. W. Winget, Mr. Plowman showed the proper method for selecting pumps by gpm against head. He discussed several installations with unusual problems and gave suggestions for pump selection for cooling tower use to help prevent common problems in this application.

C. H. Dollmeyer was appointed chairman of the nominating committee. Attendance 25. Attendance ratio 0.42.

• *NORTHERN OHIO*: Pres. L. N. Hunter pointed out that the *IBR, SBI, AGA, HP&ACCNA* codes, and the Testing and Rating Codes for Boiler Burner Units provide a common yardstick for measurement and result in improved boiler design. Speaking in November on *The Rating of Heating Boilers,* President Hunter closed his talk with a description of the aims and activities of the ASHAE, Committee on Code for Testing and Rating Heavy Duty Furnaces, and demonstrated how this work assists the industry. Attendance 102.

• *NORTHERN OHIO*: *Perimeter Heating* was the subject of an October panel, consisting of George Gould, advertising manager, Viking Air Conditioning Corp., who spoke on *Warm Air;* John Lushbaugh, heating and air conditioning engineer, Cleveland Electric Illuminating Co., on *Electric Heating;* and W. W. Lige, W. W. Lige & Associates, on *Hot Water.* Program Chairman J. R. Venning introduced the three speakers, all of Cleveland, who gave a resume of their interests, experiences and plans in perimeter heating.

Unanimously elected to the Chapters Conference Committee were Vice Pres. L. C. Burkes, member, and H. R. Canoyer, alternate. Pres. D. E. Mannen introduced the new officers, board of governors, and committee chairmen. Attendance 85.

• *OKLAHOMA*: Secy. F. R. Denham presided at the November meeting at which Second Vice Pres. John W. James, Chicago, was guest speaker. In his delivery, *Give the Public What They Need,* Vice President James summarized the past and future of air conditioning. Attendance 55. Attendance ratio 0.48.

• *ONTARIO*: In response to a suggestion by Pres. M. C. Bailey, individual contributions were made by members at the November meeting for flood relief in Toronto, necessitated by Hurricane Hazel, and were matched by the Chapter treasury, giving a total of $637.

Heat—Past, Present and Future was the topic of guest speaker, H. E. Voegeli, development engineer, American Brass Co., Waterbury, Conn. Among the interesting phases of his discussion were the future use of the heat pump, utilization of solar heat, and summer storage of solar heat for use during winter. Attendance 100.

• *ONTARIO*: Enthusiastic reception was given in October to First Vice Pres. J. E. Haines' predictions for *The Next Ten Years.* Vice President Haines, Minneapolis, Minn., accompanied his address with slides.

Pres. M. C. Bailey announced the death of T. C. Clapperton, one of the Chapter's very popular members.

President Bailey also announced the refusal with regret of an invitation to attend Buffalo Chapter's October meeting, since this date was the Canadian Thanksgiving. Attendance 98.

• *OTTAWA VALLEY*: An entertaining presentation on glass fibers was given by P. Sweeney, manager, Central Ontario Sales, Fiberglas Canada, Ltd., who was introduced at the October meeting by E. J. Schoenherr. Mr. Sweeney mentioned various types of insulation used in industry today—batt and rigid types for building, pipe insulation for practically all ranges of temperature, various duct insulations including acoustical treatment, and air filters. As a matter of interest to the audience he showed materials made of glass fiber and plastics utilizing glass fibers.

Mr. Schoenherr was elected as member to the Chapters Conference Committee, with W. W. Hodgins as alternate. Attendance 28. Attendance ratio 0.49.

• *PHILADELPHIA*: E. R. Kaiser, director of research, ASHAE Research Laboratory, Cleveland, Ohio, gave an informative report in November on the Committee on Research.

Earle Barker, eastern seaboard transportation manager, Minneapolis-Honeywell Regulator Co., Minneapolis, Minn. discussed *Heating, Ventilating and Air Conditioning of Transportation Equipment.* Program Chairman C. J. Lubking introduced both speakers.

It was announced by John Everetts, Jr. that the F. Paul Anderson Medal would be awarded to C. S. Leopold, Philadelphia Chapter member, at the banquet during the Annual Meeting, in January 1955.

• *PITTSBURGH*: Eleven past presidents were present at the November meeting to hear First Vice Pres. J. E. Haines speak on *The Next Ten Years.* The members took interest in noting the progress of the Society in the last 10 years, and listened to the Vice President's predictions for the future. R. M. Toucey introduced the speaker. Attendance 68.

• *ROCKY MOUNTAIN*: Society Pres. L. N. Hunter, Johnstown, Pa. was introduced to the members at the November meeting by Pres. V. F. Vallero. Previous to his major topic, President Hunter briefly described the functions and accomplishments of the Society, and outlined the research activities conducted both through the research facilities of the Society and those projects assigned to various universities.

In his informative talk on *The Rating of Heating Boilers,* President Hunter compared the rating codes of *IBR, SBI, AGA,* and *HPACCNA,* and described the factors necessary for consideration in their use. F. C. Allen, Rocky Mountain Chapter vice president, expressed the Chapter's appreciation to President Hunter for his appearance and timely information. Attendance 50.

• *SACRAMENTO VALLEY*: A cake with 2 candles was presented to the Sacramento Valley Chapter in honor of its second birthday by Eric Roberts, president of the Golden Gate Chapter, at the joint Golden Gate-Sacramento Valley November meeting. Pres. J. E. Marshall accepted a gift of glassware from D. E. McLeod, Golden Gate vice president, and in turn presented President Roberts with a cake for his birthday.

Answering his own question, *Where Do We Get the Power?*, J. K. Carr, Sacramento Municipal Utility District, briefly outlined the history of the district, and suggested possible solutions for an expected power shortage in California in the near future. Attendance 81. Attendance ratio 0.44.

• *ST. LOUIS*: Guest speaker for the November meeting, Walter Temple, Jr., field service engineer, Petro Co., Cleveland, Ohio, was introduced by E. T. Clucas. Mr. Temple stated that the selection of the proper fuel is largely an economic consideration, depending on the individual application. He compared atomizing and rotary cup oil burners, mentioning the advantages and disadvantages of both.

E. C. Kuntz and J. J. Blackmore were elected to the Board of Governors. Attendance 59.

• *SHREVEPORT*: *The best heating and air-conditioning system has not been installed* challenged J. E. Haines, Society second vice president, in concluding his speech on *The Next Ten Years* at the October meeting. Vice President Haines, Minneapolis, Minn., had first reviewed the increases in consumer buying, construction and Society activity over the past 10 years, pointing out the valuable contributions of the ASHAE Research Laboratory in Cleveland. He estimated future increased population which would result in increases in the construction industry, and in the number of schools and hospitals. Vice President Haines believes that engineering and research must continue at a faster rate. The Society, especially through the activities of the Long-Range Planning Committee, he stated, is doing much to meet the needs of our growing world. Attendance 40. Attendance ratio 0.84.

• *SOUTH CAROLINA*: J. E. Haines, first vice president of the Society, Minneapolis, Minn., gave a talk at the November meeting on the subject, *The Next Ten Years.* Mr. Haines gave a resume of the last 10 years, and predictions for the next 10 years as to business growth in general and the construction industry in particular. He also described the Society's work in new developments and progress. Attendance 75. Attendance ratio 0.47.

Rocky Mountain Chapter officers meet with ASHAE Pres. L. N. Hunter at November meeting. (*l.* to *r.*) Fred Janssen, past president of the chapter; B. H. Spurlock, Jr., member of ASHAE Council; President Hunter, guest speaker; V. F. Vallero, chapter president; F. C. Allen, vice president; D. D. Pearsall, secretary

AMERICAN SOCIETY OF HEATING AND AIR-CONDITIONING ENGINEERS

JOURNAL SECTION

• *SOUTH TEXAS*: After the dinner hour, Pres. J. W. Holland called the October meeting to order by introducing the head table. Reg. F. Taylor, Society past president, reported on the Council meeting held in Indianapolis in October when the change of Society name was discussed.

D. M. Mills, a member of the Society's Council, read a letter from C. R. Gardner of Dallas regarding arranging a special Texas car for the trip to the Annual Meeting in Philadelphia. C. L. Fleming was appointed chairman of a committee to promote this special car.

Guest speaker of the evening was Ben Beaird who talked on the *Economical Design of Duct Work*. Mr. Beaird pointed out that proper design and complete details shown on drawings, and complete cooperation and correlation between the architect, engineer and contractor, would result in a far better and more economical job for the owner.

J. C. Lewis was elected member of the Chapter's Conference Committee and C. L. Fleming was elected alternate member. Attendance 81.

• *SOUTHERN CALIFORNIA*: The November meeting took the form of an inspection tour of the Southern California Gas Co. where the members and guests saw an installation of absorption-type water chilling machines. Following the tour, a movie, entitled, *The Challenge of Growth* was viewed by the audience which was received with great interest. The movie pictured the phenomenal growth of Southern California together with the problems which a public utility organization encounters to maintain progress and expansion.

Pres. C. D. Walz presented L. B. Davenport with the past president's pin. Attendance 67.

• *SOUTHERN PIEDMONT*: Vice Pres. L. F. Lawrence, Jr., presiding at the October meeting, reminded the members of the Annual Meeting to be held in Philadelphia, January 1955.

C. H. Reed, vice president, Duke Power Co., spoke on the growth of the Piedmont Carolinas. Attendance 21. Attendance ratio 0.18.

• *TOLEDO*: The November meeting at the Toledo Elks Club was called to order by Pres. F. C. Richardson. Robert Greenwald, delegate to the Toledo Technical Council, reported on the meeting of that group which he had attended, at which Dean Carson spoke on *The Position of the Engineer in Society*. President Richardson announced that the Board of Governors had authorized the ASHAE to present a gavel in the name of the Toledo Chapter to the new Bluegrass Chapter chartered November 18 in Louisville, Ky.

Speaker of the evening was Paul Gravelle of the Toledo Edison Co., who illustrated his talk on the Bayshore Station with slides, and provided much interesting information on the economies and engineering involved. Mr. Gravelle stated that expansion of electric power use would indicate that during each 10-year period, 2½ times as much power was needed as during the preceding 10-year period. Attendance 76. Attendance ratio 0.80.

• *VIRGINIA*: After a social hour and dinner the October meeting was called to order by Pres. H. E. Marquart at Burrough's Restaurant. An Auditing Committee was appointed with M. H. Pelosi, Jr., as chairman, and a nominating committee was appointed with J. F. Boyenton as chairman.

W. G. Maynard introduced the guest speaker of the evening, W. J. Killian, assistant manager, Unit Ventilator Dept., American Air Filter Co. who gave a talk on heating and ventilation in schools. Attendance 26. Attendance ratio 0.42.

• *WASHINGTON, D. C.*: The joint annual meeting of the Washington and Baltimore Chapters, ASHAE, and the Baltimore-Washington Section, *ASRE* was held at the Army Chemical Center, Edgewood, Md. in November. After the welcoming address by Brig.-Gen. J. R. Burns, P. R. Achenbach introduced Paul Bales, Chemical Corps Medical Laboratories, and S. Y. Smith, consulting engineer, Baltimore, who presented a technical paper on *Climatic Chambers for Physiological Studies*. Another paper was presented by Warren Viessman, Chemical Corps Engineering Agency, on *Atmospheric Control of Protective Shelters*.

This unusual and pleasant trip included tours of post facilities — gas and particulate filter manufacture, climatic chambers and protective shelters. Attendance 25. Attendance ratio 0.14.

• *WEST TEXAS*: *New Welding Procedures* was the topic of V. H. Lyon, divisional sales manager, Eutectic Welding Alloys Corp., New York, N. Y. in addressing the October meeting.

Pres. L. C. McKay presided. Attendance 30. Attendance ratio 0.35.

• *WESTERN NEW YORK*: Members and guests at the October meeting enjoyed a talk by Society president L. N. Hunter on the rating of automatic-fired heating boilers. President Hunter limited his discussion to gas- and oil-fired units, and listed the various codes in use today. He also indicated the important factors in rating boilers and compared nomenclature used in different codes.

Pres. Q. P. Thompson appointed C. W. Stone as member and C. W. Kaupp as alternate member to the Chapters Conference Committee. V. N. Harwood, delegate to the *Technical Societies' Council*, gave a report of the last *TSC* meeting, and suggested a speaker from *TSC* be invited to a future meeting to discuss the annual panel discussions held by *TSC*. Attendance 48. Attendance ratio 0.61.

Candidates for Membership

The Society's By-Laws require that all applications for membership or advancement are to be sent to the Executive Secretary and the names of applicants and their references shall be printed in the next issue of the Journal of the Society, or mailed to all members. When the replies are received from references the Candidate's application shall be submitted to and acted upon by the Admission and Advancement Committee as soon as possible.

When the Admission and Advancement Committee has acted favorably upon a Candidate's application and assigned his grade, the Council shall confirm the election of the proposed Candidate for membership. During the past month there have been 137 applications for membership, including 29 student applications and 6 reinstatements; in addition 18 advancements have been received. The names of these men and their sponsors are published in the following list.

Members are requested to scrutinize the list with care. The Admission and Advancement Committee, and in turn, the Council, urge members to assume their share of responsibility of receiving these candidates into membership by advising the Executive Secretary promptly of any whose eligibility for membership is in any way questioned.

All correspondence in regard to such matters is strictly confidential, and is solely for the good of the Society, which it is the duty of every member to promote.

Unless objection is made by some member by January 31, 1955, these candidates will be voted upon by the Council. Those elected to membership will be notified by the Executive Secretary immediately after election.

Note: †Reinstatement. *Non-member. △Advancement.

Arizona

Brooks, E. B., Asst. Mgr., Kricher Asbestos & Rubber Co., Phoenix. References: John Boylson, V. J. Carns, H. E. Kraft, J. J. Vargo.

Arkansas

Jewell, N. F., Partner, Jewell & Co., Hot Springs. References: R. E. Blaylock, J. L. Brown, W. J. Franklin, C. H. Miller.

California

Dierker, C. T., Staff Supvsr., New Construction Sales, Southern California Gas Co., Los Angeles. References: W. J. Biggar, E. C. Evans, R. H. Phillips, L. B. Rayl.

Haldeman, H. F., Pres., Harry F. Haldeman, Inc., Los Angeles. References: C. S. Anderson, A. J. Hess, H. P. Sheldon, R. C. Taylor.

△Hellman, A. A., Chief Mech. Engr., Arthur Froehlich, Archt. & Engrs., Beverly Hills. References: A. J. Hess, A. Z. Levine, K. D. Simon, R. M. Storms.

Martus, G. F., Service and Installation Mgr., Minneapolis-Honeywell Regulator Co., San Francisco. References: R. C. Cushing, L. E. Dwyer, J. E. Marshall, J. E. Murray.

Miller, Jack, Designer, Hinkston & Norcross, Los Angeles. References: E. B. Hilton, B. M. Lemos, I. F. Norcross, F. A. Sayler*.

Molan, R. E., Sales Engr., M. W. Sausse & Co., Los Angeles. References: C. S. Anderson, J. R. Hall, G. D. Lord, C. D. Walz.

Yeh, Horace, Mech. Engr., Thomas B. Bourne Associates, Inc., San Francisco. References: G. H. Anderson*, M. F. Hoppe, H. M. Sharp*, John Smith*.

Connecticut

Boling, Cecil, Pres., The Bush Manufacturing Co., West Hartford. References: T. L. Arnold, A. J. Hess, Fritz Honerkamp, D. D. Wile.

DeFelice, F. C., Cons. Engr., New Haven. References: F. J. Dixon*, Herman Goldbecker*, Frank Massari*, Walter Schilling*.

Georgia

△Ammons, H. A., Owner, Harold A. Ammons, Mech. Engr., Atlanta. References: F. W. Bull, J. M. Lazenby, William McKinney, Peter Van Dae, Jr.

Sweatte, J. E., Sales Engr., Georgia Power Co., Atlanta. References: Ben Askew*, Joe Browder*, J. W. Thompson, R. W. Wages.

Illinois

Behls, H. F., Asst. Instructor, University of Illinois, Urbana. References: J. R. Fellows, J. A. Henry*, S. Konzo, H. E. Straub.

Brill, J. W., Engr., Charles E. Crone Co., Chicago. References: C. W. DeLand, E. P. Heckel, Jr., A. J. Vercruyssen, F. E. Zimmerman.

Hoier, W. V., Pres., Robert Gordon, Inc., Chicago. References: W. M. Brayton, Herbert Kreisman, S. A. Pope, E. R. Teske.

†Linehan, L. D., Br. Mgr., American Air Filter Co., Chicago. References: N. E. Bueter, H. G. Gragg, J. H. Milliken, C. A. Pickett.

Patek, E. N., Mgr., Heating Dept., Warren Barr Supply Co., Chicago. References: A. H. Blaker, D. W. Davis, J. S. Kearney, L. H. Streb.

△Scott, J. C., Dist. Contract Mgr., The Powers Regulator Co., Chicago. References: A. M. Bladen, W. S. Bodinus, E. R. Gritschke, J. S. Kearney.

Sidney, E. J., Sales Engr., Fenner & Potvin, Inc., Chicago. References: H. E. Anderson, Lester Koetz, L. J. Potvin, E. R. Teske.

Sohn, T. L., Estimator, L. H. Sohn & Co., Chicago. References: N. S. Booth, F. W. Luft, Jr., S. F. Rost, H. H. Van Epps.

Iowa

Smith, M. L., Mfrs. Repr., Davenport. References: J. W. James, W. G. Pennington, D. E. Schroeder, L. M. Smith.

Kansas

△Hysom, E. E., Owner, E. E. Hysom & Associates, Wichita. References: D. M. Allen, Carl Clegg, A. P. Francis, J. H. Traynor.

△Mikesell, J. C., Engr., S. A. Long Co., Wichita. References: D. M. Allen, R. L. Pennington, T. L. Roberts, Charles Yoe.

Kentucky

Allen, J. R., Vice-Pres., Air Conditioning Corp., Louisville. References: W. J. Davis, O. J. Hill, D. J. Rank, A. P. Shanklin.

Brocks, J. W., Gen. Mgr., Fiberglas Contracting & Supply Co., Louisville. References: Richard Brown*, Walter Conlin*, Fred Elswick*, Tyler Rogers*.

Schuler, J. N., Treas., Hart Furnace & Supply Co., Inc., Louisville. References: A. E. Hausmann, W. M. Pace*, E. G. Zanone, H. A. Zanone.

†Sowerby, C. C., Products Sales Mgr., American Air Filter Co., Inc., Louisville. References: C. H. Burnap, L. S. Gilbert, I. B. Helburn, J. W. May.

Louisiana

Lewis, W. A. J., Vice-Pres., Lewis Electric Supply, Ruston. References: O. J. Dykes, Jr., W. E. FitzGerald, C. M. Hadra, J. S. Malahy, Jr.

Massachusetts

Boucher, W. A., Htg. & Vtg. Engr., Fred C. McClean Heating Supplies, Inc., Springfield. References: R. E. Cross, C. E. Gill, F. C. McClean, M. T. McClellan*.

Curran, J. J., Johnson Service Co., Springfield. References: R. B. Cahoon, J. H. Colby, E. J. Hoagland, W. G. Martin, Jr.

Dunlap, L. M., Design Engr., Francis Associates, Marion. References: E. G. Carrier, J. H. Colby, C. H. Dow, Thayer Francis*.

Lampert, L. L., Jr. Engr., Buerkel & Co., Inc., Boston. References: F. J. Butler, A. E. Kent, K. W. Maki, D. C. Miller.

Michigan

Berg, P. J., Dist. Mgr., Dravo Corp., Detroit. References: B. A. Dean, Lester Maurer, B. B. Reilly, J. H. Spitzley.

†Delany, W. F., Repr., The Trane Co., Detroit. References: A. L. Ciesliga, L. F. Major, D. L. McConachie, K. J. Wagoner.

Groner, G. P., Appl. Engr., D. T. Randall & Co., Detroit. References: Lester Maurer, J. B. Olivieri, F. A. Sando, R. E. C. Strand.

Hoenle, R. M., Draftsman, Chrysler Corp., Detroit. References: Marko Bobaljik, J. B. Freeman, D. F. Robertson, E. J. Weiss.

Liebrecht, E. C., Appl. Engr., Westinghouse Electric Corp., Sturtevant Div., Detroit. References: J. G. Black, Philip Cohen, Lester Maurer, Robert Mercer.

Linsenmeyer, L. J., Mech. Engr., The Nichols Co., Detroit. References: C. J. Freund*, J. E. Lay, F. J. Linsenmeyer, J. J. Vicker.

Proulx, V. A., Mech. Designer, Giffels & Vallet, Inc., Detroit. References: Henry Gray, Lester Maurer, F. J. Orians, Peter Turner.

Reynolds, C. C., Design Engr., W. A. Witheridge Co., Saginaw. References: A. C. Jones*, W. A. Leesch, Jr., R. F. Snyder*, J. M. Witheridge.*

†Rubin, Louis, Estimator, Central Heating Co., Detroit. References: James Beattie*, M. A. Gross, Fred Layne*, John Leiber.

△Scarlett, H. O., Air Conditioning Engr., S. S. Kresge Co., Detroit. References: P. S. Hosman, J. N. Livermore, Albert Petronis, D. F. Robertson.

Starkey, C. H., Commercial Div. Mgr., Minneapolis-Honeywell Regulator Co., Detroit. References: R. P. Butler, E. F. Glanz, C. F. Hoffman, Lester Maurer.

△Witheridge, J. M., Vice-Pres., W. A. Witheridge Co., Saginaw. References: G. M. Beach*, W. A. Leesch, Jr., R. F. Snyder*, William Spears*.

Minnesota

Byrne, E. W., Supvsr. of Heating, St. Paul School Board, St. Paul. References: J. H. Baker, C. E. Gausman, G. F. Gausman, F. F. Lange.

Chapple, R. S., Sales Engr., The Trane Co., St. Paul. References: R. V. Griffiths, William McNamara, J. W. McNamara, M. R. Paulsen.

△Legler, W. F., Htg. Engr., The Waterbury Co., Minneapolis. References: A. B. Algren, T. C. Gianos, D. W. Mathison, C. A. Schad.

Missouri

Bauer, W. K., Vice-Pres., Midwest Machinery Co., St. Louis. References: J. J. Blackmore, B. C. Compton*, E. C. Kuntz, R. H. Metcalfe.

Cuba, J. F., Chief Engr., Airtherm Mfg. Co., St. Louis. References: M. D. Brandwine, J. E. Dube, E. F. Ince, H. J. Kipp.

Farrow, J. B., Vice-Pres., Debco Equipment Co., St. Louis. References: C. J. Baker, B. L. Evans, E. C. Kuntz, Louis Stechan.

△Kindred, J. E., Jr., Mech. Engr., W. L. Cassell, Kansas City. References: W. L. Cassell, Carl Clegg, G. F. Hellmer, Henry Nottberg, Jr.

Kirts, L. M., Engr., Kewanee-Ross Corp., Kansas City. References: A. R. Barnes, R. B. Mason, E. W. Rand, E. C. Thompson.

Nicholas, R. A., Exec. Secy., *Commercial Sheet Metal Contractors Association*, Kansas City. References: J. E. Miller, C. W. Schumacher, L. W. Zahner, Jr., L. W. Zahner, Sr.

Nebraska

Berry, R. M., Repr., American Radiator & Standard Sanitary Corp., Omaha. References: F. F. Dodds, C. A. Goth, Orville Pratt, O. J. Smith.

Mittauer, G. C., Repr., Ilg Electric Ventilating Co., Omaha. References: C. R. Crowder, C. A. Goth, K. E. Martin, O. R. Pratt.

Plugge, R. L., Mgr., Insulation Dept., Charles T. Vaughn Co., Omaha. References: R. C. Dearing, C. A. Goth, K. R. Magarrell, E. N. Seiler.

Reed, H. E., Owner, Harlan E. Reed Co., Omaha. References: C. A. Goth, R. E. Mason, B. R. Peterson, E. N. Seiler.

Ryan, W. L., Design and Installation, Olson Bros., Inc., Omaha. References: C. W. Amidon, G. C. Deas, R. N. Gates, M. J. Olson.

Tapy, F. E., Engr., William R. White Co., Omaha. References: K. R. Magarrell, E. N. Seiler, M. F. Stober, W. R. White.

New York

Bertolami, U. A., Estimator, Air & Refrigeration Corp., New York. References: J. H. Burges, H. S. Dutcher, W. L. Fleisher, Sr., D. C. Lindsay.

Braun, A. J., Sales Engr., Oneida Supply Co., Oneida. References: I. C. Barber*, F. E. Krell, W. L. Lynch, C. J. Nagle.

Carleton, H. S., Jr., Vice Pres., Trojan Hardware Co., Troy. References: N. W. Burrill, D. A. Carofano, H. F. Kruger, E. J. Mahoney.

Dybvik, Harold, Air Cond. Engr., A. J. Eckert Refrigeration Corp., Albany. References: N. W. Burrill, F. R. Foote, R. D. Marshall, R. L. Miller.

Gill, W. N., Engr., American Blower Corp., Syracuse. References: C. R. Acheson, F. W. Chadwick, A. L. Jones, C. F. Woese.

Husk, N. G., Jr., Engr., Buffalo Forge Co., Buffalo. References: J. H. Bryce, C. C. Cheyney, H. E. Friedrich, W. R. Heath.

Kemly, R. J., Engr., Ilg Electric Ventilating Co., New York. References: D. J. Citron, Edward Devine*, Robert Gilsdorf*, C. W. Stewart.

△Nestle, J. D., Design Engr., Voorhees, Walker, Foley & Smith, New York. References: Maurice Benton, M. A. Haber, J. W. Habjan, J. J. Kopecky.

Nielson, R. W., Mgr., Filter Div., Akron Rubber Co., New York. References: J. T. Avery, Lester T. Avery, E. F. Poling*, W. T. Van Orman.

Pascale, J. V., Design Engr., Horace A. Bond, Albany. References: H. A. Bond, H. S. Bond, C. D. Cross, F. W. Sheldon.

Posma, A. A., Jr., Genl. Supt., R. D. Myers, Inc., Norwich. References: D. J. Girard, W. L. Riehl, J. W. Stevens, Merle Weninger.

Punj, V. P., Pres., Potter Seymour, Inc., New York. References: D. L. Baker, H. L. Laube*, H. S. Ormsbee*, Andrew Reiss*.

Roth, R. L., Vice Pres., L. J. Roth Sheet Metal and Roofing, Rochester. References: L. L. Dollinger, Jr., L. M. Hakes, J. W. Kozacar, J. Q. Treadway.

North Carolina

Amick, C. E., Sales Engr., Johnson Service Co., Greensboro. References: M. L. Eakes, H. B. Hoffman, S. T. Oliver, D. T. Waynick.

Finley, R. E., Designer, Beaman Engineering Co., Greensboro. References: R. F. Bean, J. R. Clark*, M. L. Eakes, David Rickelton.

Holder, R. G., Jr., Engr., Page Air Conditioning Co., Inc., Charlotte. References: Edwin Jones, R. O. McGary, F. J. Reed, E. D. Streng.

Ohio

Giffin, Worth, Htg. Engr., N. S. Larsen Plumbing Co., Toledo. References: H. W. Dirks, J. F. Guest, L. B. LaFrance, F. C. Richardson, Jr.

Kerka, W. F. Research Engr., ASHAE Research Laboratory, Cleveland. References: A. D. Hughes, Milosh Popovish*, G. E. Thornburg, G. L. Tuve.

Mills, J. M., Htg. & Plbg. Designer, Walker, Norwick & Assocs., Dayton. References: R. A. Frey, J. B. Rishel, F. W. Spencer, R. B. Walcott.

△Pressler, C. W., Pres., Obenauer-Pressler Corp., Cleveland. References: Lester T. Avery, Dennis Boggs, C. E. Hansen, R. E. Leising.

△Salsburg, J. F., Mech. Engr., The Austin Co., Cleveland. References: R. L. Geiger, W. A. Hunting*, R. H. Miller*, J. W. Wickert.

Oklahoma

△Ervin, G. E., Owner, The Gordon E. Ervin Co., Oklahoma City. References: J. H. Carnahan, W. J. Collins, Jr., F. X. Loeffler, Jr., J. R. Patten.

†Lockwood, G. E., Engr., O'Connor-Oklahoma Co., Inc., Oklahoma City. References: J. H. Carnahan, F. R. Denham, G. E. Ervin, A. C. Shelley.

Miller, C. D., Gen'l. Supt., C. C. Cooke Co., Oklahoma City. References: W. J. Collins, Jr., G. E. Ervin, F. X. Loeffler, Jr., A. C. Shelley.

Redpath, J. G., Estimator, Griffin Grocery Co., Muskogee. References: E. B. Cover, H. W. Meinholtz, J. F. Moss, W. K. Smauder.

△Watt, J. N., Engr., Watt Plumbing, Air Conditioning & Electric Co., Tulsa. References: C. H. Dollmeyer, A. D. Holmes, H. W. Meinholtz, R. W. Winget.

Oregon

Larkin, J. A., Mech. Engr., John H. Bonebrake, Cons. Engr., Portland. References: Bruce Adams, J. H. Bonebrake, W. R. Norte, G. G. Van Alst.

Saulsbury, J. M., Service Repr., The Trane Co., Portland. References: Bruce Adams, D. L. Benz, O. T. Jacobson, J. P. McDermott.

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Pennsylvania

Daily, C. E., Sales Engr., Penn Ventilator Co., Philadelphia. References: C. F. Dietz, E. H. Fiigon, A. G. Mutimer, K. W. Will.

Haller, F. A., Air Conditioning Repr., Manufacturer's Light & Heat Co., Pittsburgh. References: C. R. Henry, W. W. Johnson, H. A. Pietsch, W. C. Wessner*.

Howarth, E. S., Chief, Mech. Engrg. Div., Aluminum Company of America, New Kensington. References: A. L. Jaros*, A. T. Jorn, B. B. Reilly, B. R. Small.

Murdock, W. R., Sales Mgr., Trion, Inc., McKees Rocks. References: H. E. Gray, G. F. Landgraf, C. S. Stephens, H. C. Washechek.

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Roos, R. A., Engr., W. J. Keist & Son, Inc., Pittsburgh. References: J. H. Allison, D. B. Hicks, W. E. Keist, F. C. McIntosh.

Wilson, R. H., 3rd, Estimator, Huffman-Wolfe Co. of Philadelphia, Philadelphia. References: H. N. Jacobs, Sydney Kane, F. R. Kelble, Sr., F. R. Kelble, Jr.

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Texas

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Utah

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Wisconsin

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Canada

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Denmark

△Werner, George, Chief Engr., Nordisk Ventilator Co., A/S, Copenhagen. References: Poul Becher, Erik Kaempe*, P. H. Oppenheimer, Jorgen Varming.

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American Society of Heating and Air-Conditioning Engineers

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OBITUARIES

LAWRENCE L. ANTHES
Toronto, Ont., Can.

Lawrence L. Anthes, 78, died on November 23, 1954 at his home in Toronto. A Life Member of ASHAE since 1950, he had retired as an executive in 1949.

Mr. Anthes was born in Toronto on November 26, 1876, and attended the Parkdale Collegiate Institute. He joined the staff of Anthes Foundry, Ltd., Toronto in 1896, becoming secretary-treasurer in 1914, and president in 1932. He also served as president of Lennox Furnace Co. of Canada, Ltd., and Imperial Iron Corp., Ltd., St. Catharines; and Anthes-Imperial, Ltd., Toronto.

He served as president of the Canadian Manufacturer's Association, 1933-34, and was the only Canadian ever to hold the office of president of the American Foundrymen's Association. He had been a member of the Society since 1935.

Surviving are a daughter, Jane McLean Anthes, and two sisters, Mrs. Herbert Locke, and Miss Libbie Frances Anthes.

HERMANN S. BOGATY
Philadelphia, Pa.

Hermann S. Bogaty, a Life Member of the Society, died on November 26, 1954 at the age of 68. At the time of his death, he was chief design engineer on tobacco machinery, Proctor & Schwartz, Inc., Philadelphia, Pa.

Born in Warsaw, Poland on January 1, 1886, he conducted his university studies in Germany. He was connected with the Otis Elevator Co., New York, N. Y. previous to joining Proctor & Schwartz, Inc. in 1910. Starting as a draftsman with the latter company, he progressed to designer, chief draftsman, and chief engineer. Later, he relinquished the position of chief engineer to devote his design talents to specialized industries. Mr. Bogaty lost his sight in 1944, but carried on his work despite this handicap. He joined the Society in 1921, receiving his Life Membership in 1951.

Mr. Bogaty's immediate family who survive are his wife, Mary; his daughter and son-in-law, Mr. and Mrs. Charles DuBose, New York, N. Y.; and his granddaughter, Pamela DuBose.

JOSEPH V. KOUBEK
Cleveland, Ohio

The Society has learned of the recent death of Joseph V. Koubek, mechanical engineer, National Carbon Division, Union Carbide and Carbon Corp., Cleveland, Ohio.

Mr. Koubek was born in Cleveland on December 25, 1898. He received a B.S. from the Case School of Applied Science in 1923 and joined the National Carbon Co., Inc., as it was formerly known, in the following year. In addition to ASHAE membership since 1944, he was a member of the *American Concrete Institute* and the Lion's Club.

He is survived by his wife, who resides in Cleveland.

WILLIAM S. PETERS
San Jose, Calif.

Word has been received from Golden Gate Chapter of the recent death of William S. Peters, a member of the Society for the past 10 years.

Born in San Jose, Calif. on June 9, 1904, Mr. Peters attended school there. In 1922 he started as apprentice plumber and steamfitter in the employ of his father, A. J. Peters. After working up to the position of foreman steamfitter, he became co-owner of A. J. Peters & Son in 1932, and general manager four years later. He was president and manager at the time of his death.

Mr. Peters was a past president of the *Association of Plumbing Contractors of California* and second vice president of the *National Association of Plumbing Contractors.*

Surviving are his wife, Kathleen, his son and daughter.

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*Member of Committee on Research.

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(59 Chapters; 1 Special Branch; 8 Student Branches)

Date indicates year organized; an address and no city shown signifies same city as headquarters; numeral in parentheses indicates zone.

- **ARIZONA:** 1953. Hdqrs., Phoenix. Meets, 1st Mon. PRES., V. J. Carns, 3602 N. 15th Dr. SECY., A. J. Nelesen, Jr., 6744 N. 14th Pl.
- **ARKANSAS:** 1952. Hdqrs., Little Rock, Ark. Meets, 3rd Tues. PRES., R. E. Blaylock, 509 E. Markham St. SECY., J. L. Brown, 212 Terminal Warehouse Bldg.
- **ATLANTA:** 1937. Hdqrs., Atlanta, Ga. Meets, 2nd Mon., PRES., J. M. Lazenby, 8 11th St., N.E. SECY., F. W. Bull, 1205 Spring St., N.W.
- **BALTIMORE:** 1949. Hdqrs., Baltimore, Md. Meets, 3rd Wed. PRES., E. H. Taze, 33 E. 21st St. (18). SECY., R. F. Weisman, 4650 Reisterstown Rd. (15).
- **BLUEGRASS:** 1954. Hdqrs., Louisville, Ky. Meets, 2nd Mon. PRES., J. W. May, 215 Central Ave., SECY., A. E. Hausmann, 227 Lowell Ave., Charlestown, Ind.
- **BRITISH COLUMBIA:** 1952. Hdqrs., Vancouver, B.C., Canada. Meets, 2nd Wed. PRES., S. C. Gale, 1628 W. 4th Ave. SECY., D. A. English, 1606 W. 1st Ave. (9)
- **CENTRAL NEW YORK:** 1944. Hdqrs., Syracuse, N. Y. Meets, 4th Wed. PRES., F. D. Putnam, 115 Pulsifer Dr., Auburn. SECY., Merle Weninger, 230 Goodrich Ave. (5).
- **CENTRAL OHIO:** 1944. Hdqrs., Columbus, Ohio. Meets, 3rd Mon. PRES., J. A. Guy, 478 W. Fifth Ave. (1). SECY., W. A. Schoonover, 2901 N. High St. (2).
- **CINCINNATI:** 1932. Hdqrs., Cincinnati, Ohio. Meets, 1st Tues. PRES., F. W. Wilson, 222-24 E. 14th St. SECY., R. G. Anderson, 1758 Elmore St. (23).
- **CONNECTICUT:** 1940. Hdqrs., New Haven, Conn. Meets, 3rd Thurs. PRES., C. L. L'Hommedieu, 76 Blatchley Ave. SECY., Walter Heywood, 14 Hartt Lane, Newington.
- **DELTA:** 1939. Hdqrs., New Orleans, La. Meets, 3rd Tues. PRES., C. V. Bankston, 2927 Jackson Ave. (25). SECY., W. B. Martin, Jr., 314 St. Charles Ave. (12)
- **EMPIRE STATE CAPITAL:** 1951. Hdqrs., Albany, N. Y. Meets, 2nd Wed. PRES., E. C. Doyle, 315 Washington Ave. SECY., H. F. Kruger, 501 Seventh Ave., Troy.
- **GOLDEN GATE:** 1937. Hdqrs., San Francisco, Calif. Meets, 1st Thurs. PRES., Eric Roberts, 417 Market St. SECY., F. K. Crouch, 906 Cerrito St., Albany (6).
- **ILLINOIS:** 1906. Hdqrs., Chicago, Ill. Meets, 2nd Mon. PRES., G. V. Zintel, 840 N. Michigan Ave. (11). SECY., H. G. Gragg, 228 N. LaSalle St. (1).
- **INDIANA:** 1943. Hdqrs., Indianapolis, Ind. Meets, 4th Tues. PRES., P. O. Patterson, 2701 Roosevelt Ave. SECY., A. O. Roche, Jr., 3950 Broadway (5).
- **INLAND EMPIRE:** 1950. Hdqrs., Spokane, Wash. Meets, 1st Mon. PRES., H. A. Bickel, E. 7 Riverside Ave. SECY., Max Tonn, S. 4021 Latawah St.
- **IOWA:** 1940. Hdqrs., Des Moines, Ia. Meets, 2nd Tues. PRES., W. E. Nanes, 220 Davidson Bldg. SECY., D. E. Schroeder, 2717 Cambridge.
- **KANSAS:** 1951. Hdqrs., Wichita, Kan. Meets, Tues. after 1st Mon. PRES., Charles Yoe, P.O. Box 2239. SECY., T. L. Roberts, 2008 S. Parkwood Lane.
- **KANSAS CITY:** 1917. Hdqrs., Kansas City, Mo. Meets, 1st Mon. PRES., F. K. Ladewig, 3527 Broadway (11). SECY., R. M. Spencer, 1510 Main St. (8).
- **MANITOBA:** 1935. Hdqrs., Winnipeg, Man., Canada. Meets, 4th Thurs. PRES., G. T. Christie, Midland & Notre Dame. SECY., A. J. McIntyre, 935 Garwood Ave.
- **MASSACHUSETTS:** 1912. Hdqrs., Boston, Mass. Meets, 3rd Tues. PRES., G. W. Sprague, 108 Cummington St. SECY., W. G. Burbo, 137 Newbury St. (16).
- **MEMPHIS:** 1944. Hdqrs., Memphis, Tenn. Meets, 3rd Mon. PRES., A. W. Shelby, 972 Union Ave. SECY., A. T. Bevil, 1638 Union Ave. (4)
- **MIAMI VALLEY:** 1950. Hdqrs., Dayton, Ohio. Meets, 1st Wed. PRES., R. W. Kimmel, 320 Loneworth St. (2). SECY., J. B. Rishel, 656 Selma Rd. (9).
- **MICHIGAN:** 1916. Hdqrs., Detroit, Mich. Meets, 1st Mon. after 10th of month. PRES., E. F. Glanz, 1761 W. Forest Ave. (8). SECY., J. H. Spitzley, 1200 Fort St., W. (26).
- **MINNESOTA:** 1918. Hdqrs., Minneapolis, Minn. Meets, 1st Mon. PRES., J. A. Craig, 814 S. Ninth St. (4). SECY., E. T. Erickson, 500 Baker Arcade (2).
- **MISSISSIPPI:** 1953. Hdqrs., Jackson, Miss. PRES., J. E. Davis, Jr., P.O. Box 3216, West Jackson (7). SECY., L. H. Smith, 711 W. Capitol St.
- **MONTREAL:** 1936. Hdqrs., Montreal, Que., Canada. Meets, 3rd Mon. PRES., D. L. Lindsay, 4350 Sherbrooke St. (6). SECY., S. R. Plamondon, 2267 Melrose Ave. (14).
- **NEBRASKA:** 1940. Hdqrs., Omaha, Neb. Meets, 2nd Tues. PRES., C. A. Goth, 3115 N. 49th Ave. SECY., L. J. Paulsen, 1901 S. 39th St.
- **NEW MEXICO:** 1954. Hdqrs., Albuquerque, N. M. PRES., J. H. Van Alsburg, 1330 Cerro Gordo, Santa Fe. SECY., J. K. James, 4462 Avenida del Sol.
- **NEW YORK:** 1911. Hdqrs., New York, N. Y. Meets, 3rd Mon. PRES., R. L. Stinard, 51 E. 42nd St. (17). SECY., Carl H. Flink, 62 Worth St. (13).
- **NORTH JERSEY:** 1952. Hdqrs., Newark, N. J. Meets, 2nd Tues. PRES., H. M. Patrick, 20 Olcott Ave., Bernardsville. SECY., W. C. Kruse, Jr., 183 N. 13th St. (7).
- **NORTH TEXAS:** 1938. Hdqrs., Dallas, Tex. Meets, 3rd Mon. PRES., M. W. Brown, 1213 Texas Bank Bldg. SECY., H. G. Gregerson, 2921 Fairmount.
- **NORTHEASTERN OKLAHOMA:** 1948. Hdqrs., Tulsa, Okla. Meets, 2nd Tues. PRES., R. W. Winget, 2428 E. 11th St., Box 100. SECY., J. T. McKinney, 1341 So. Boston.
- **NORTHERN OHIO:** 1916. Hdqrs., Cleveland, Ohio. Meets, 2nd Mon. PRES., D. E. Mannen, 9104 Woodland Ave. (3). SECY., H. R. Canoyer, 1900 Superior Ave. (14).
- **NORTHERN PIEDMONT:** 1952. Hdqrs., Greensboro, N. C. Meets, 2nd or 3rd Friday. PRES., R. B. Crosland, Jr., 1001 S. Marshall St., Winston-Salem. SECY., W. H. Cooper, 1001 S. Marshall St., Winston-Salem.
- **OKLAHOMA:** 1935. Hdqrs., Oklahoma City, Okla. Meets, 2nd Mon. PRES., G. E. Ervin, 2800 N. Oklahoma St. (5). SECY., F. R. Denham, 320 Oklahoma Natural Bldg.
- **ONTARIO:** 1922. Hdqrs., Toronto, Ont., Canada. Meets, 1st Mon. PRES., M. C. Bailey, 1139 Bay St. SECY., H. R. Roth, 57 Bloor St., W.
- **OREGON:** 1939. Hdqrs., Portland, Ore. Meets, Thurs. after 1st Tues. PRES., E. E. Kelly, 4504 S.W. Corbett Ave. (1). SECY., K. N. Flocke, 3027 N.E. 31st Ave. (12).
- **OTTAWA VALLEY:** 1952. Hdqrs., Ottawa, Ont., Canada. Meets, 3rd Tues. PRES., W. J. Robinson, 200½ Bank St. SECY., N. J. Howes, Box 264, R.R. 1.
- **PACIFIC NORTHWEST:** 1928. Hdqrs., Seattle, Wash. Meets, 2nd Tues. PRES., T. C. Caskey, 11642—26th Ave., S. (88). SECY., E. W. Triol, 407 Medical Arts Bldg. (1).
- **PHILADELPHIA:** 1916. Hdqrs., Philadelphia, Pa. Meets, 2nd Thurs. PRES., L. M. Church, 12 S. 12th St. (7). SECY., C. J. Forve, Parkwood Manor, Apt. B-202, State Rd. & Penarth Ave., Upper Darby.
- **PITTSBURGH:** 1919. Hdqrs., Pittsburgh, Pa. Meets, 3rd Mon. PRES., E. C. Hach, 221 Broadmoor Ave. (34). SECY., E. H. Riesmeyer, Jr., 231-33 Water St. (22).
- **ROCKY MOUNTAIN:** 1944. Hdqrs., Denver, Colo. Meets, 1st Wed. PRES., V. F. Vallero, 620 12th St. SECY., Duane Pearsall, 1600 W. 13th Ave.
- **SACRAMENTO VALLEY:** 1952. Hdqrs., Sacramento, Calif. Meets, 1st Wed. PRES., J. E. Marshall, 441 Pico Way. SECY., V. W. Thornburg, 2470 27th Ave.
- **ST. LOUIS:** 1918. Hdqrs., St. Louis, Mo. Meets, 2nd Tues. PRES., G. H. Bemarkt, St. Clair Dr., R.R. 1, Caseyville, Ill. SECY., W. P. Norris, 1118 Fullerton Bldg.
- **SHREVEPORT:** 1948. Hdqrs., Shreveport, La. Meets, 3rd Thurs. PRES., J. S. Malahy, Jr., 1839 Line Ave. SECY., H. E. Scott, 2502 Woodford St.
- **SOUTH CAROLINA:** 1954. Hdqrs., Columbia, S. C. PRES., R. F. Donovan, P.O. Box 3053. SECY., J. E. McMurray, 1639 Blanding St.
- **SOUTH TEXAS:** 1938. Hdqrs., Houston, Tex. Meets, 3rd Fri. PRES., J. W. Holland, 245 Esperson Bldg. (2). SECY., J. C. Lewis, Box 8188.
- **SOUTHERN CALIFORNIA:** 1930. Hdqrs., Los Angeles, Calif. Meets, 1st Tues. PRES., C. D. Walz, 3600 San Pasqual St., Pasadena (10). SECY., H. F. Ulovec, 3886 Olympiad Dr. (43).
- **SOUTHERN PIEDMONT:** 1952. Hdqrs., Charlotte, N.C. PRES., R. S. Fullerton, P.O. Box 3697. SECY., J. R. Clark, P.O. Box 1755.
- **SOUTHWEST TEXAS:** 1946. Hdqrs., San Antonio, Tex. Meets, 3rd Tues. PRES., L. H. Hornor, Jr., 816 Insurance Bldg. SECY., Boone Crisp, P.O. Box 9065 (4).
- **TOLEDO:** 1954. Hdqrs., Toledo, Ohio. PRES., F. C. Richardson, Jr., 1938 Shenandoah Rd. (7) SECY., J. F. Guest, 1815 N. 13th St. (2).
- **UTAH:** 1944. Hdqrs., Salt Lake City, Utah. Meets, 3rd Thurs. PRES., A. A. Maycock, P.O. Box 36 (10). SECY., W. L. Stuewe, 1472 S. State St. (4).
- **VIRGINIA:** 1946. Hdqrs., Norfolk, Va. Meets, 3rd Wed. PRES., H. E. Marquart, 111 W. Main St. SECY., R. L. Burton, Jr., 1913 Lafayette Blvd.
- **WASHINGTON, D. C.:** 1935. Hdqrs., Washington, D. C. Meets, 2nd Wed. PRES., G. C. F. Asker, 1109 W. Broad St., Falls Church, Va. SECY., C. P. Humke, 5905 Berwyn Rd., Rt. 1, Box 89, College Park, Md.
- **WEST TEXAS:** 1953. Hdqrs., Lubbock, Tex. PRES., L. C. McKay, 210 Sanford Bldg. SECY., J. C. Wharton, Box 1240.
- **WESTERN MICHIGAN:** 1931. Hdqrs., Grand Rapids, Mich. Meets, 2nd Mon. PRES., F. W. Brundage, 512 N. Park St., Kalamazoo (11). SECY., F. L. Murray, 482 W. Michigan Ave., Battle Creek.
- **WESTERN NEW YORK:** 1919. Hdqrs., Buffalo, N. Y. Meets, 2nd Mon. PRES., Q. P. Thompson, 260 Richmond Ave. (22). SECY., G. E. Kuhn, 475 Woodland Dr., Kenmore (23).
- **WISCONSIN:** 1922. Hdqrs., Milwaukee, Wis. Meets, 3rd Mon. PRES., L. C. Plaehn, 914 N. Broadway (2). SECY., H. W. Alyea, 507 E. Michigan St. (2).

SPECIAL BRANCH

- **SWITZERLAND:** 1952. Hdqrs., Zurich. PRES., H. C. Bechtler, Anemonenstrasse. 40 (47). SECY., Walter Hausler, Erbstrasse 2, Kusnacht.

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- **NORTH CAROLINA STATE COLLEGE:** 1948. Hdqrs., Raleigh, N. C. PRES., Alvah Ehrman, Box 4502, State College Station. SECY., E. W. McDonald, 1010½ Vance St.
- **OKLAHOMA A. & M. COLLEGE:** 1950. Hdqrs., Stillwater, Okla. PRES., C. E. Durrett, 1215 College. SECY., R. M. Jauch, 308½ W. Maple.
- **OREGON STATE COLLEGE:** 1949. Hdqrs., Corvallis, Ore. Meets, 1st Wed. after 1st Tues. PRES., R. E. Bulletset, 252 Kings Rd. SECY., I. P. Parkhurst, 1354 Harrison.
- **PURDUE UNIVERSITY:** 1948. Hdqrs., W. Lafayette, Ind. CHAIRMAN, E. B. Katz, 415 State St. SECY., R. A. Chambers, 248 Littleton.
- **TEXAS A. & M. COLLEGE:** 1946. Hdqrs., College Station, Tex. Meets, 2nd and 4th Tues. PRES., D. F. Carroll, Box 6264. SECY., C. W. Farrar, Jr., Rt. 1, Box 339, Bryan.
- **UNIVERSITY OF DETROIT:** 1949. Hdqrs., Detroit, Mich. Meets 1st Tues. PRES., J. C. Rumpf, 16511 Muirland (21). SECY., L. J. Hayes, Jr., University of Detroit.
- **UNIVERSITY OF TEXAS:** 1949. Hdqrs., Austin, Tex. Meets, 1st and 3rd Tues.
- **UNIVERSITY OF TORONTO:** 1951. Hdqrs., Toronto, Ont., Canada. CHAIRMAN, Alexander Tudor, 75 South Dr. SECY., T. M. Devine, More House, St. Michaels College.

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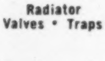

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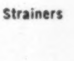

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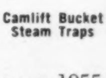
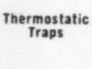
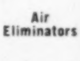


Camlift Bucket Steam Traps



Thermostatic Traps

Water Blenders



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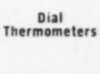

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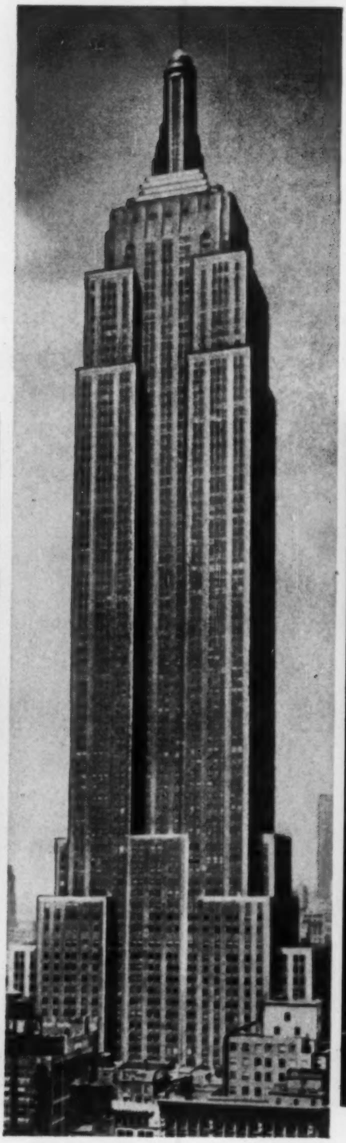

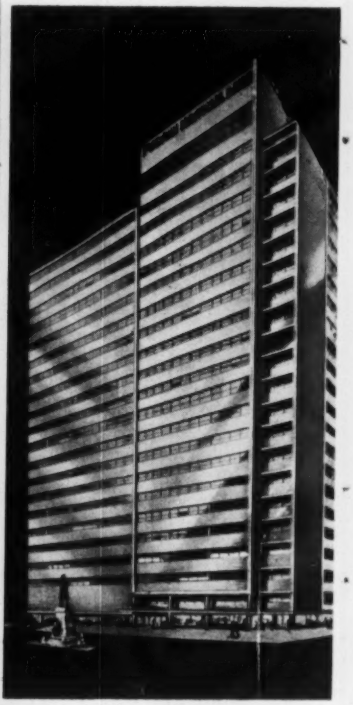

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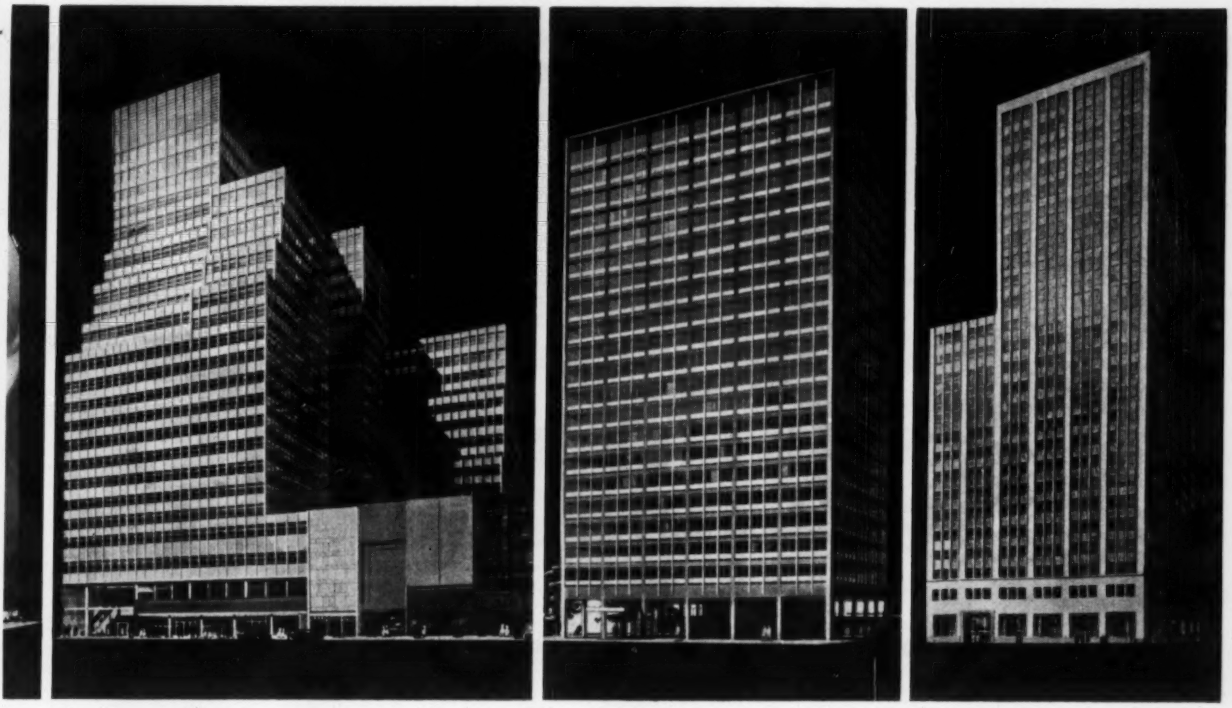

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air conditioning and refrigeration

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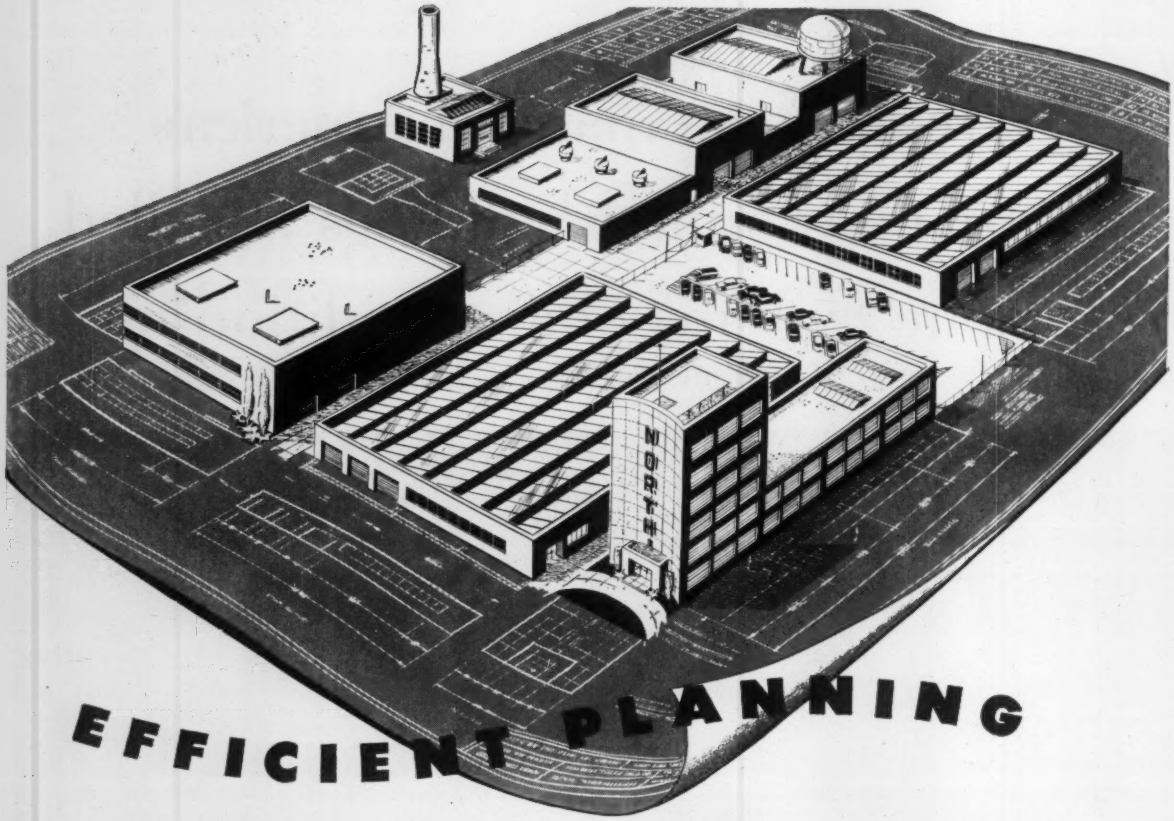


EFFICIENT PLANNING

Starts with RIC·WIL

- Early planning with a RIC-WIL field representative on central heating or air conditioning systems will mean less work later on. Custom engineering and prefabrication of RIC-WIL units offer quick, efficient installation. RIC-WIL's engineering service with forty-five years experience in the Insulated Piping Field is available for *early* planning and consultation.

RIC-WIL
Insulated Piping Systems
THE RIC-WIL COMPANY

Write or phone your nearest representative or send for the illustrated RIC-WIL catalog.

Quality Piping Systems of the . . .
. . . Highest Thermal Efficiency

RIC·WIL
INCORPORATED

PREFABRICATED **INSULATED PIPING SYSTEMS**

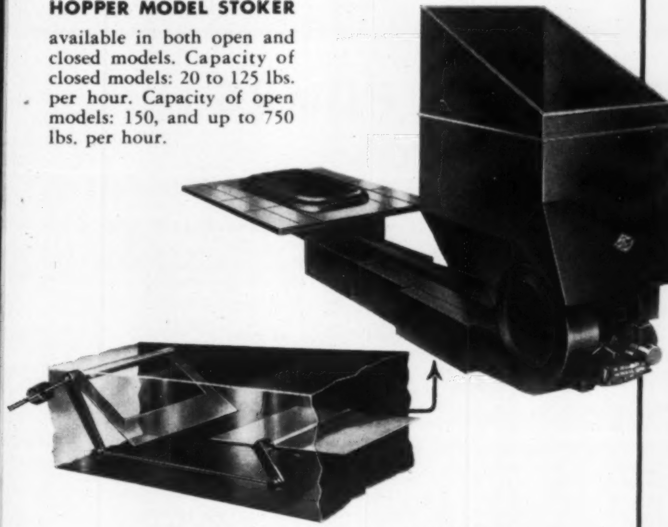
BARBERTON, OHIO

SAFE, CLEAN COAL HEAT...

ENGINEERED FOR LOW COST INSTALLATION... TROUBLE-FREE OPERATION & MAINTENANCE—*OBTAIN ALL THESE ADVANTAGES WITH A* WILL-BURT STOKER

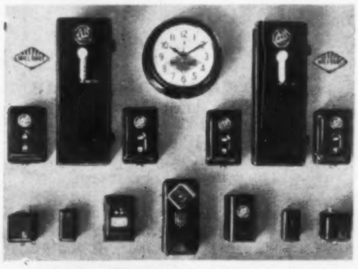
WILL-BURT HOPPER MODEL STOKER

available in both open and closed models. Capacity of closed models: 20 to 125 lbs. per hour. Capacity of open models: 150, and up to 750 lbs. per hour.



WILL-BURT AUTOMATIC AIR CONTROL

assures the proper combustion of fuel during the operating period as well as during the time the blower and feed screw are off. This patented device prevents a condition of smoke and soot. It allows for dissipation of any intense heat that may be surrounding the tuyeres or dead plate by permitting induction of normal draft to the fire bed. It automatically assures the most efficient combustion of bituminous coal in ever-changing fuel bed conditions.



PANEL BOARDS

Prewired, pretested control panel boards provide an interconnected control system for stokers to be operated by either a common operating and/or individual holdfire control, depending on the setting of the safety switch, off-on switch and timeswitch cycle. Mounting wall brackets are provided. Not illustrated, but available are control cabinets with controls mounted and wired on a sub-panel and completely enclosed in a heavy steel cabinet.

Coal fired with a Will-Burt Stoker is the preferred method of heating wherever low-cost installation, clean coal heat and a factor of greater safety are of utmost importance. Will-Burt Stokers are engineered for application to a variety of coal burning boilers and furnaces, providing trouble-free performance, particularly where installations in schools, hospitals, churches, institutions, apartments and factory buildings require relief from maintenance throughout the heating seasons. The Will-Burt patented automatic air control delivers the correct quantities of air for complete efficient combustion during the operating and off periods—providing low-cost, clean coal heat. Prevention of smoke and soot, such as is usually prevalent when the fire is starved for air, is practically eliminated by air automatically induced to meet ever-changing fuel bed conditions.

Automatic and efficient controlled heating, as well as a factor of greater safety, is assured with Will-Burt Stoker safety devices and control panel—available in a standard unit ready to install and operate. Safety shear pin and disconnect switch are provided on all model stokers and are designed to be reset easily without any special tools. A bell or light signal can be installed to indicate a sheared pin.

"Coal fired with a Will-Burt Stoker" is low-cost heat.

Write for Engineers' Reference Manual which includes general stoker data and suggested specifications for stokers; also installation diagrams for Will-Burt hopper and bin fed stokers and Will-Burt control panels.

WILL-BURT BIN FEED STOKERS

reduce cost of coal handling and maintenance to an all-time low. For application with various types of bituminous coal burning boilers and furnaces.

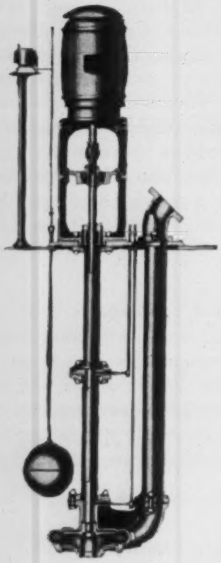
The **WILL-BURT** *Company*

OVER TWENTY-FIVE YEARS IN THE STOKER BUSINESS
BOX 902 • ORRVILLE, OHIO

8 Ways to Handle Special Building

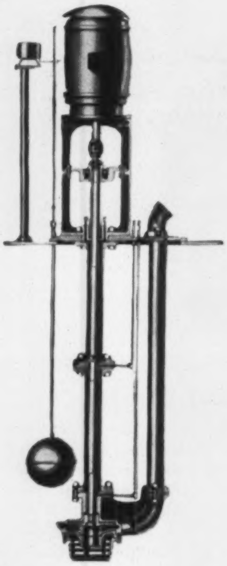
The Yeomans line of waste-handling pumps is complete. No need to look farther for the exact pump to meet an especially tough problem, whether it be a solids carrying liquid or solids free. Both vertical centrifugal and pneumatic ejector types are available to meet a wide range of requirements and prices,—all designed and built to Yeomans strict standards for dependable, year-in, year-out service and the ability to perform *instantly* when called upon,—all covered by the Yeomans acceptance of full responsibility for satisfactory operation when installed as recommended.

VERTICAL WET PIT CENTRIFUGAL PUMPS



SERIES 8000 HEAVY DUTY SCREENLESS EJECTORS for liquids containing solids, dirt and trash; for heavy liquids. storm drainage and industrial uses. Smallest units pass 2½" solids.

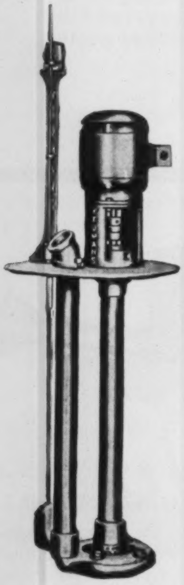
Heavy, close-grained cast iron pump casing streamlined to flow. LUBRI-VAC® Lubricating System consisting of specially designed repelling vanes and lubricating lines to bearing and lubricant eliminates scoring of radial bearing. High carbon piston steel shaft, turned, ground and polished; adjustable single row ball thrust bearing; flexible coupling. Pump casing hung from steel suspension plate. Automatic control. Capacities from 75 to 1200 g.p.m.; heads to 70 ft.



SERIES 3000 BILGE OR SUMP PUMP for solids-free liquids from drainage and seepage, sewage effluents and industrial process wastes. LUBRI-VAC® System standard on all units.

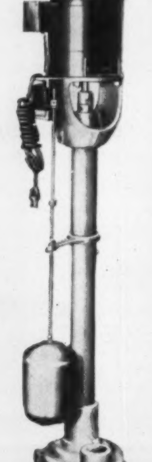
A heavy-duty wet pit pump supplied as a complete unit including pump casing, impeller, shaft, suspension and discharge pipes, thrust bearing and flexible coupling assembled on a suspension plate with a catch basin or sump cover, with motor and automatic control equipment. Normally furnished with standard float and stand, but special automatic controls and floats supplied when specified. Gravity or forced feed automatic or non-automatic lubrication as required. Capacities from 15 to 1200 g.p.m.; heads to 75 ft.

YEOMANS PUMPS
GIVE YEOMAN SERVICE



SERIES 3100 BILGE OR SUMP PUMP—Top Suction Type-for homes, residential buildings, industrial plants, sewage and water treatment plants, recreation parks, pools, and similar applications.

Meets the need for a moderate price pump of heavy duty construction for capacities to 120 g.p.m. and heads to 46 ft. Designed and built to Yeomans strict engineering standards with self-adjusting flexible coupling, liberal size stainless steel true running shaft, renewable sleeve guide bearings and bronze impeller with large water passages, balanced hydraulically and mechanically. Duplex sets with interchanger which divides the work between pumps is recommended for longer life and emergency use.



"DRAIN-DRI" SUMP PUMP for buildings and industrial use.

Built like a heavy-duty Yeomans municipal pump. Hard finished, balanced, non-clogging impeller passes matches, laundry waste and basement trash. Extra large stainless steel shaft is highly polished, turned and ground. Float switch actuated by heavy copper float with guided float rod. Large area, heavy cast iron screen will not bend or get out of shape to destroy its effectiveness. Permanently aligned, dripproof, ball bearing motor, 1750 r.p.m. 60 cycle or 1450 r.p.m. 50 cycle can be supplied with diving bell for rugged underground duty. Non-corrosive and non-rusting metals used where necessary for protection. Sump depths from 2 ft. to 10 ft. Capacities to 85 g.p.m.; heads to 30 ft.

and Industrial Waste Problems!

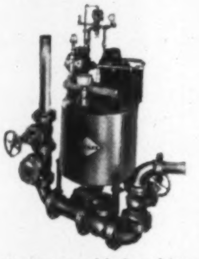
Selection of the most efficient equipment for handling sewage and industrial wastes depends primarily on the gallonage to be pumped. Centrifugal pumps are quite effective when the volume is large, but when the gallonage scales down, a point is reached where good engineering switches from a centrifugal pump to a pneumatic ejector. That is why Yeomans makes both centrifugal and pneumatic ejector types and recommends the type of pumping equipment which experience has proven to be best suited in terms of efficiency, dependability and cost.

PNEUMATIC EJECTOR PUMPS

TYPE SDV SHONE® PNEUMATIC EJECTORS are the mechanically controlled type and are recommended for most installations.

The Shone Ejector passes solids up to 4″ in the smallest ejector size and neither screens or shredders are required to prevent clogging. It has no internal parts to restrict flow; is simple in design, positive in action and performs indefinitely without wear, care or attention. Liquid waste is collected in a large pot containing an upper and lower bell. As the liquid level rises, first the lower then the upper bell is buoyed up to permit a counter balance to close the exhaust connection and admit compressed air. Air pressure closes the inlet check valve, opens the discharge check valve and the liquid enters the lift line under pressure. Maintenance is negligible. The simple parts are few and do not move far or fast. Frequent check-ups are not required. Capacities from 30 to 1.000 gallons; heads from 15 to 50 ft.

TYPE SEC SHONE PNEUMATIC EJECTORS are electrically controlled by two rigid stainless steel electrodes of unequal length suspended in the receiver. The rising liquid closes the circuit between them and energizes a relay which starts the air compressor. Compressor shuts off when liquid drops below the longest electrode. Otherwise the operation cycle is the same as in Type SDV Capacities from 30 to 600 gallons; heads from 15 to 50 ft.

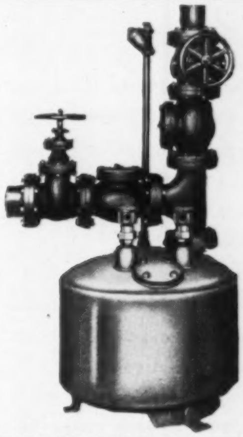


PACKEX PNEUMATIC EJECTOR is an economy packaged, low capacity pump designed especially for small buildings, small residential groups and similar smaller installations which must have dependable lift service. It is factory-assembled and is received complete ready for inlet and discharge connections; no additional electric work is required, nor does it necessitate a wet well. It will handle solids up to 2½ inches in volumes up to 20 g.p.m. and is completely sanitary with a hermetically sealed pot.

® Registered Trademark.

EXPELSOR PNEUMATIC EJECTOR is applicable for all small-volume waste removal. It is effective in operation, economical to operate and low in first cost. Consisting of a hermetically sealed receiver, the Expelsor is equipped with two rigid metal electrodes suspended in the receiver as in the Type SEC Shone Ejector and operates in the same manner to push the liquid waste up and out through the discharge line. Solids up to the size of inlet and discharge connections pass through easily. It does not require a wet well.

The Expelsor can be operated by plant air or steam, or by air from a Yeomans Air Compressor and is therefore adaptable to many different conditions. Capacities from 30 to 100 g.p.m. and larger; heads from 10 35 ft.



A Competent Man on Pumps . . . the Yeomans Representative

When in the market for a pump, you want and welcome the counsel of a man who not merely knows pumps but is trained to *understand the problem you expect the pump to solve.*

You'll find your local Yeomans representative just the man you're looking for. He operates, or is a member of, his own business. He handles several excellent lines of equipment in the same market category as Yeomans Pumps. As a rule, he has an engineering degree—in some instances he's a capable "engineer by osmosis." In any case, he's a good business man, fully qualified to analyze a problem and to recommend a practical solution.

You'll find him listed in the Classified Directory under "Pumps"—a good man to know.

YEOMANS BROTHERS COMPANY
2000-5 N. Ruby Street, Melrose Park, Illinois

Please send me the bulletins checked below without obligation.

- ☐ Screenless Solids-Bearing Wet Pit Pumps
- ☐ Bilge or Sump Centrifugal Wet Pit Pumps
- ☐ Series 3100 Bilge or Sump Pumps
- ☐ Drain-Dri Cellar Pumps
- ☐ Type SDV Shone Ejector Pumps
- ☐ Type SEC Shone Ejector Pumps
- ☐ Expelsor Ejector Pumps
- ☐ Packex Ejector Pumps

Name.................................Title.......................

Company...

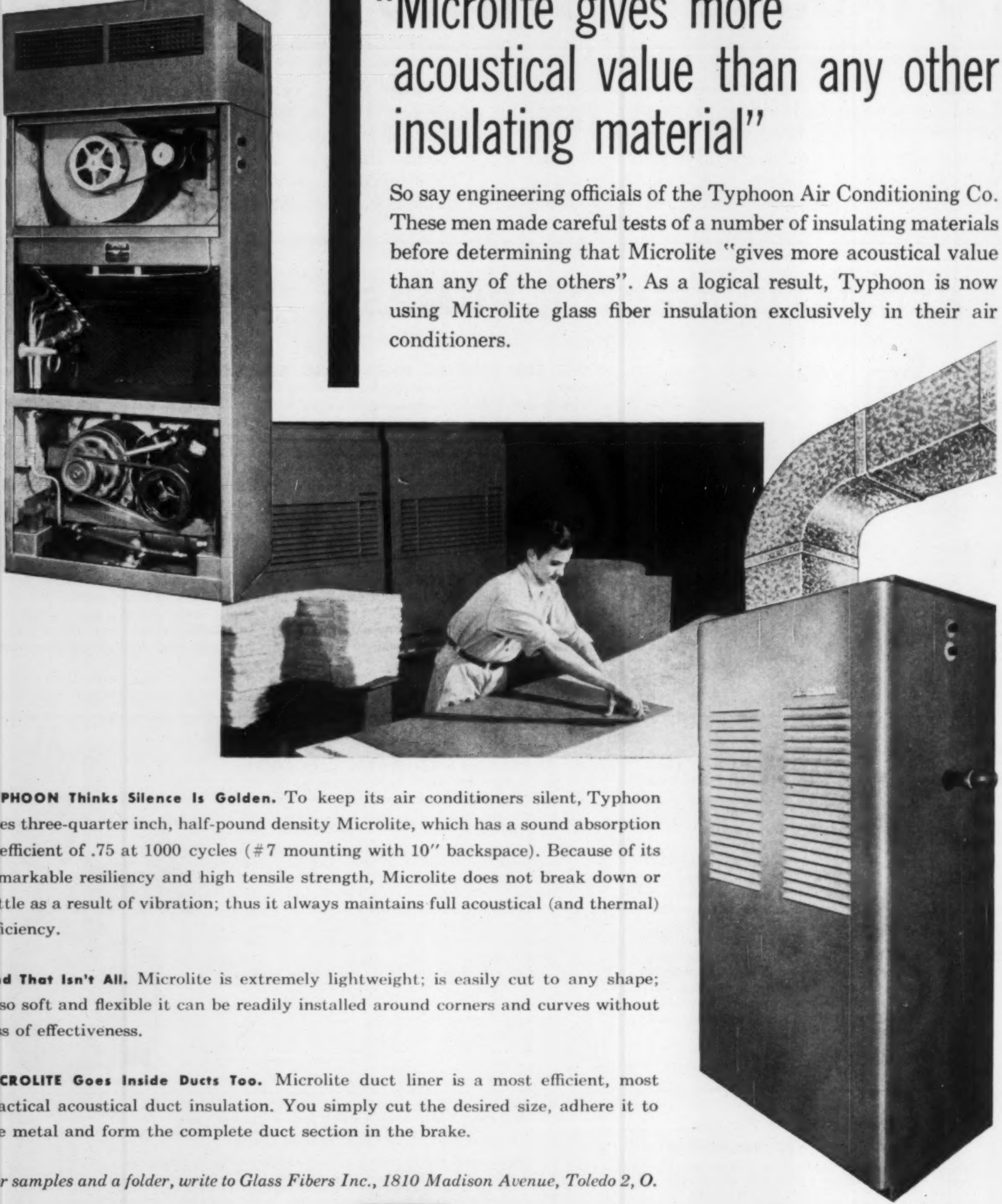
Address...

City...........................Zone......State.......................

TYPHOON uses **MICROLITE** because

"Microlite gives more acoustical value than any other insulating material"

So say engineering officials of the Typhoon Air Conditioning Co. These men made careful tests of a number of insulating materials before determining that Microlite "gives more acoustical value than any of the others". As a logical result, Typhoon is now using Microlite glass fiber insulation exclusively in their air conditioners.



TYPHOON Thinks Silence Is Golden. To keep its air conditioners silent, Typhoon uses three-quarter inch, half-pound density Microlite, which has a sound absorption coefficient of .75 at 1000 cycles (#7 mounting with 10" backspace). Because of its remarkable resiliency and high tensile strength, Microlite does not break down or settle as a result of vibration; thus it always maintains full acoustical (and thermal) efficiency.

And That Isn't All. Microlite is extremely lightweight; is easily cut to any shape; is so soft and flexible it can be readily installed around corners and curves without loss of effectiveness.

MICROLITE Goes Inside Ducts Too. Microlite duct liner is a most efficient, most practical acoustical duct insulation. You simply cut the desired size, adhere it to the metal and form the complete duct section in the brake.

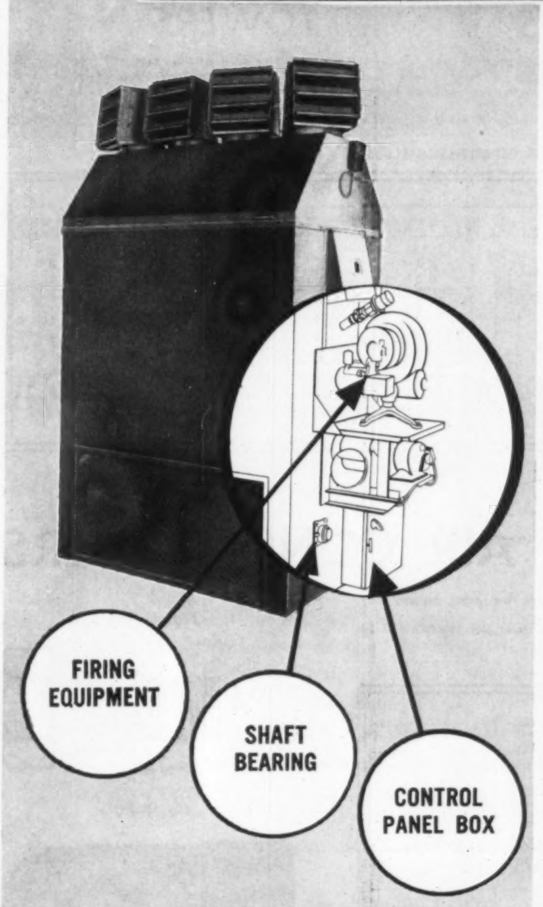
For samples and a folder, write to Glass Fibers Inc., 1810 Madison Avenue, Toledo 2, O.

VITRON Glass Textile Yarns • Rovings • Micro-Fibers
DURAMAT Vapor Barriers • **BLUE FLAG** Pipe Wrap
MICROLITE Thermal and Acoustical Insulation
COUSTIC-AIRE and **THERMO-JET** Aircraft Insulations

GLASS FIBERS *INC.*

Makers of glass fibers by the ELECTRONIC-EXTRUSION process
. . . developed, patented and used exclusively by Glass Fibers Inc.

EASY ACCESSIBILITY



EASY ACCESSIBILITY

The simplicity of accessibility is a contributing factor to the enjoyment of an Olson installation. More Olson Heaters are kept well-maintained through their long life of service because they are so easy to service. No dismantling is necessary because all the accessories are mounted on the outside of the heater; — even the control panel box is within easy reach of all adjustments and regulators. Most servicing can be performed without prolonged interruption of heat supply. This is also true of the shaft bearings which are also mounted on the outside.

CONTROL PANEL BOX

Dust tight, damp proof — located within easy sight and reach of all adjustments. Operates on 110 volts from transformer in the panel box.

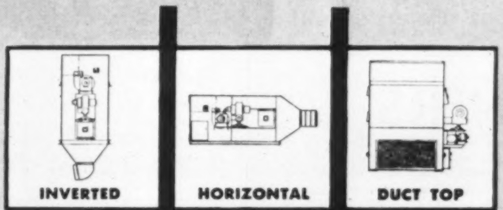
RUGGED CONSTRUCTION

Rigid base, free from vibration, low fan speed, oversize drive, heavy shaft, large self-aligning ball bearings, heavy outside casing with radiation shield and ample relief and access doors.

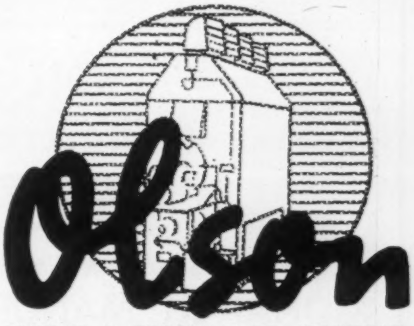
ALL POPULAR PARTS

All accessories on Olson Heaters are of the best name and quality known to heating engineers. They are standard products of nationally known manufacturers. Replacements are available anywhere.

WRITE FOR BULLETIN A1 A — DETAILED, ILLUSTRATED



Olson Heaters are available in many models and wide variation of applications of make up air, drying, high temperature and process work. Capacities range from 300,000 to 7,500,000 B.T.U. per hour.



ARTHUR A. OLSON & CO., CANFIELD, OHIO
REPRESENTATIVES IN PRINCIPAL CITIES

HEATERS FOR GAS, OIL, COAL OR DUAL GAS AND OIL

Monarch
SPRAY NOZZLES

for

AIR WASHERS . . . COOLING TOWERS

These are "non-clogging" nozzles with a single large tangential lead hole to the swirl chamber that will never clog from any impurities small enough to pass through the orifice. Swirl chamber is conical on both ends and pivots liquid like a top to produce an exceptionally fine, evenly distributed, balanced spray of about 80° included angle. Wider spray angles up to 130° can be furnished to order.

Standard material Brass. Also available in Stainless Steel and Monel. Pipe sizes from ⅛" to 1". ¼" size is 1-5/16" long and made from ⅝" square stock.

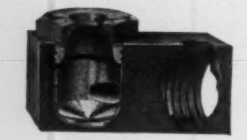


Fig. 631

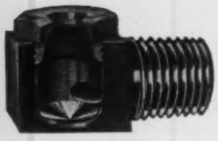


Fig. 629

CAPACITIES: GALLONS PER HOUR

Sizes			Lbs. Operating Pressure					
Pipe	Orifice	Lead	10	20	30	40	60	100
⅛" OR ¼"	69	69			2.9	3.3	4.0	5.1
	61	61		4.0	5.0	5.5	7.0	8.7
	61	53	4.4	6.2	7.5	8.3	10.3	13.0
	53	53	5.8	8.2	9.8	10.9	14.1	17.3
	49	49	9.1	11.1	13.2	15.0	19.5	24.6
	3/32"	3/32"	11.8	16.6	20.4	23.4	29.0	36.5
	⅛"	3/32"	19.5	27.6	33.3	39.1	49.0	60.0
	⅛"	⅛"	24.3	34.6	42.8	50.0	64.0	78.5
	1/64"	⅛"	31.5	46.1	57.0	64.1	81.9	105
	3/16"	5/32"	52.2	75.0	92.5	109	138	189
¼"	7/32"	3/16"	78.0	112	138	163	205	257
	7/32"	7/32"	82.0	121	152	180	225	300

HUMIDIFIERS . . . . . . AIR CONDITIONERS

The H-261 and F-80 brass nozzles produce the finest, softest, fog-like spray possible with low direct pressure only. Popular sizes are nozzle #3.00 and #5.00 tested either 80° or 120° at 25 pounds.

All Brass construction with 120 mesh Monel screen strainers and ⅛" or ¼" female or ¼" male pipe connection in the F-80 and ¼" male only in the H-261. The H-261 is 1-⅜" overall and the F-80, 1-⅞".

GALLONS PER HOUR

Nozzle No.	Lbs. Operating Pressure				
	25	40	60	80	100
1.35		.57	.69	.83	.92
1.65		.75	.89	.99	1.12
2.00		.94	1.14	1.28	1.40
2.50		1.13	1.45	1.64	1.86
3.00	1.03	1.39	1.62	1.85	1.95
3.50	1.36	1.77	2.11	2.46	2.80
4.00	1.56	2.00	2.42	2.77	3.16
4.50	1.86	2.32	2.77	3.21	3.68
5.00	2.20	2.88	3.57	4.09	4.59
5.50	2.22	2.96	3.75	4.31	4.78
6.00	2.55	3.35	4.01	4.78	5.23
7.00	2.90	3.91	4.60	5.17	6.00

Fig. H-261

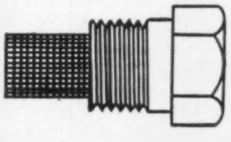
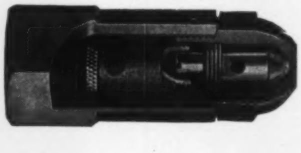
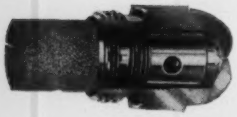


Fig. F-80



OIL BURNERS



Monarch Stainless Steel Nozzles for high pressure gun-type oil burners are the Industry yardstick for nozzle performance. Each nozzle individually tested for capacity, spray angle and uniformity of spray on No. 2 fuel oil weighing 7.16 pounds per gallon at 74°F. and 34 S. S. U. viscosity at 100°F. Standard spray angles are 30°, 45°, 60°, 70° and 80° in small sizes.

Standard capacity sizes (GPH at 100 psi.): .60, .75 .85, 1.00, 1.20, 1.25, 1.35, 1.50, 1.65, 1.75, 2.00, 2.25, 2.50, 3.00, 3.50, 4.00, 4.50, 5.00, 5.50, 6.00, 6.50, 7.00, 7.50, 8.30, 9.50, 10.50, 12.00, 13.80, 15.30, 17,50, 19.50, 21.50, 24.00, 28.00, 30.00 to 60.0 in 5.00 GPH steps and 60.0 to 100.0 in 10.00 GPH steps.

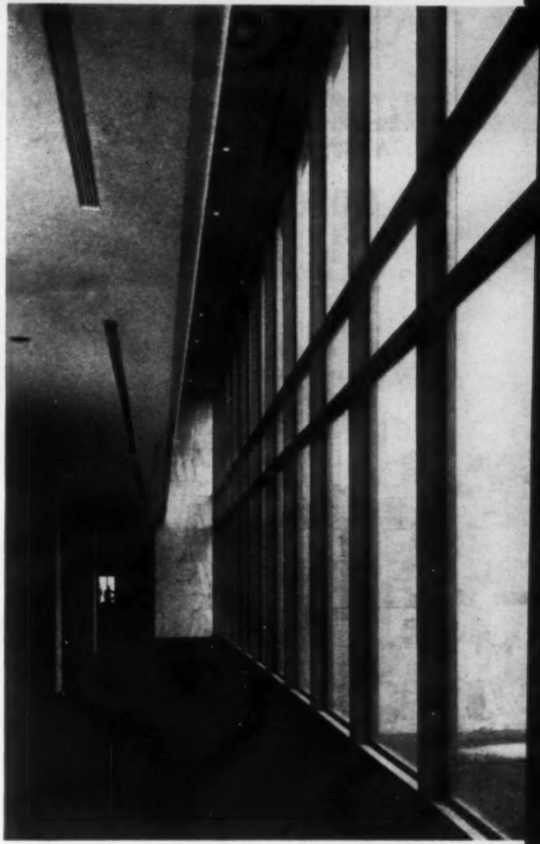
See us at the HEATING and VENTILATING SHOW — BOOTH No. 810

Write for complete catalogs and prices

MONARCH MANUFACTURING WORKS, INC.

2523 E. ONTARIO ST. **PHILA. 34, PENNA.**

CANADIAN SALES AGENT (EXCEPT B.C.): CANADIAN GENERAL FILTERS LTD., 39 CROCKFORD BOULEVARD (SCARBORO), TORONTO 16.



Design fundamentals of the

ALL-AIR HIGH VELOCITY distribution system

By F. J. KURTH | *Vice President of Engineering*

Anemostat Corporation of America

A national survey reveals that today, more than ever, engineers are studying, learning and using high velocity-high temperature differential air distribution. Here is a brief discussion of the advantages of the all-air high velocity system over conventional and mixed cycle (air and water) systems.

1. No Coils — No Clogging — No Odor—There are no coils in the all-air high velocity units. Damp coils collect lint and emit dank odors, and the coils must be cleaned periodically.

2. No Individual Fans — Filters — or Electric Motors — The all-air units operate entirely with air which is processed in the main equipment rooms. The 100% induction units utilize the kinetic energy of the high velocity air to mix primary air with the room air.

3. No Conflict of Trades— The all-air units are installed by the sheet metal trades only.

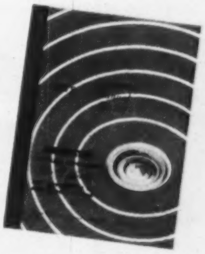
4. More Effective Use of Outside Air in Spring and Fall— More primary air is delivered to the all-air units than to induction coil units. This allows the engineers to operate in the Spring and Fall on outside air and thereby save refrigeration.

All-air high velocity units offer scientific air diffusion. Each high velocity unit is provided with an aspirating or high induction type air diffuser which is scientifically designed to diffuse air without drafts. Each unit can be pressure balanced by an easy-to-operate balancing device and a calibrated orifice. In fact, the Anemostat all-air high velocity system can be balanced more accurately than other systems and in less than half the time required to balance a low velocity system.

High velocity units require practically no maintenance after installation. They have valves of the non-corrosive, die-cast, "rocket-socket" type, which are patented by the Anemostat Corporation of America. All units can be adapted for the following variations:

1. Single duct for zone control or individual thermostatic or manual remote control.
2. Dual duct for thermostatic control or any other type of control.
3. Single or dual duct units with the diffuser fastened to the unit, or remote from the attenuating unit.
4. Under-the-window, sidewall or ceiling type installations.
5. Can be provided with standard aspirating diffusers or 100% induction type diffusers.
6. Induction type units handle temperature differentials up to 33° below ambient.

Selection Manual Contains Data on High Velocity Units



New Selection Manual 50 gives extensive selection and application data on high velocity all-air distribution systems. Write on your business letterhead for Selection Manual 50 to the Anemostat Corporation of America, 10 E. 39 Street, New York 16, New York.

See what KODY in the backroom has—VISIT . . .

BOOTH

S-6

International Heating & Ventilating Exposition

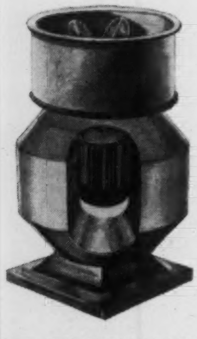
KODY
AXIAL FLOW
FANS

Follow the big red arrow on the back wall—VISIT . . .

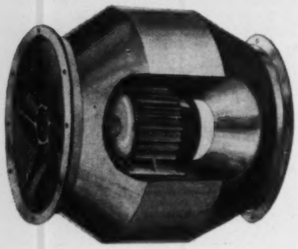
BOOTH

S-6

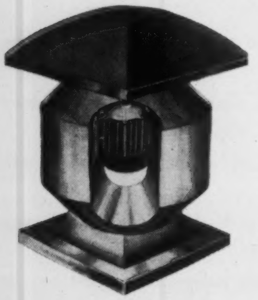
International Heating & Ventilating Exposition



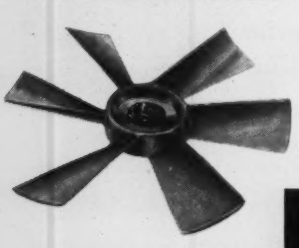
BISECTED UPBLAST ROOF FANS



BISECTED DUCT FANS



BISECTED HOODED ROOF FANS



AXIAL FLOW IMPELLERS

TOP QUALITY
PLUS
EFFICIENCY
PLUS
ECONOMY
EQUALS . . .

. . . the successful formula, built into all KODY INDUSTRIAL FANS, which adds up to your answer for any of the following air handling applications:

HIGH TEMPERATURES • CORROSION RESISTANCE
FUME, VAPOR and ODOR CONTROL
VENTILATION • INDUSTRIAL PROCESSING
HEATING, COOLING and DRYING
FORCED and INDUCED DRAFT

Another PLUS feature is the KODY AXIAL FLOW IMPELLERS specifically designed for air handling applications, with the latest improved, wide, warped, airfoil sections. These impellers are one piece castings of high yield strength aluminum alloy, stainless steel, monel or bronze. All impellers are equipped with split-tapered compression bushings for a positive clamp fit to the drive shaft.

KODY BISECTED FANS are particularly well suited for many air handling problems of the processing industries which require the trapping or removal of corrosive fumes, vapors, odors, dust, heat, etc.

KODY INDUSTRIAL FANS can be supplied in a wide range of materials; carbon steel, stainless steel, monel, aluminum, bronze, etc. for both the housings and the impellers. If your problem requires protection against the corrosive action of industrial processing vapors, Kody fans can be coated with plastisols, synthetic resins or rubber.

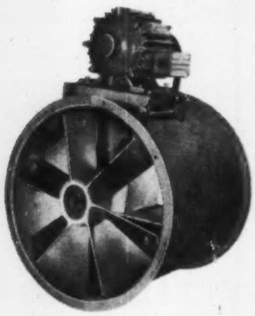
KODY INDUSTRIAL FANS are available in sizes to 60" with displacements to 85,000 cfm @ 3" W.G. . In addition to the fans shown, the KODY LINE also includes . . .

VENTURI ORIFICE FANS • PORTABLE VENT SETS
MAN COOLERS, Stationary and Portable

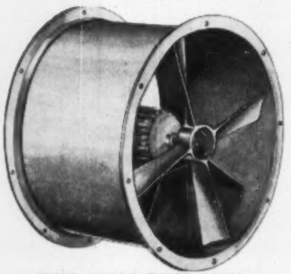
For further information about Kody products write for FREE catalogs.

A-K6

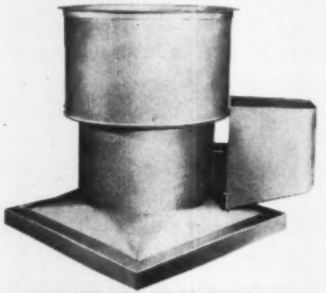
KODY BLOWER COMPANY
TRENTON, NEW JERSEY



TUBE-AXIAL DUCT FANS
Belt Drive

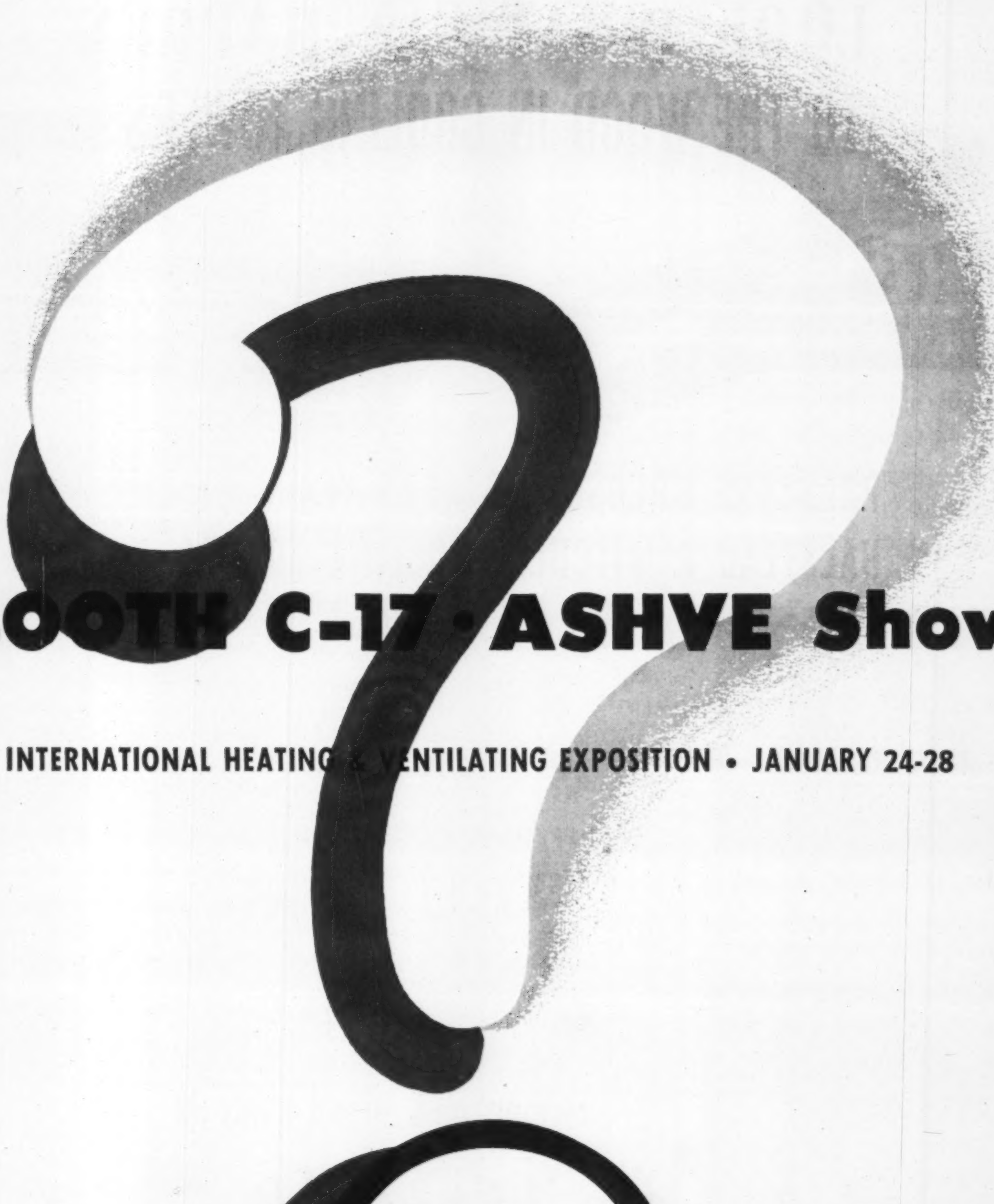


TUBE-AXIAL DUCT FANS
Direct Drive



UPBLAST ROOF FANS
V-Belt Drive and Direct-Connected Models

HOODED ROOF FANS
V-Belt Drive and Direct-Connected Models



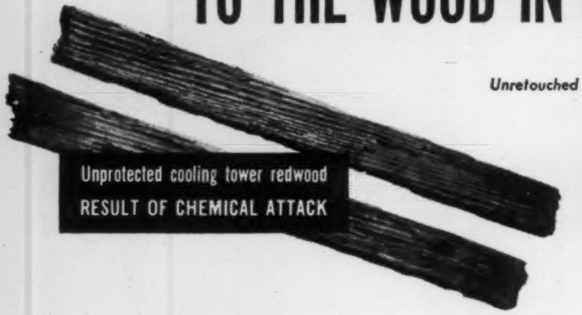
BOOTH C-17 • ASHVE Show

INTERNATIONAL HEATING & VENTILATING EXPOSITION • JANUARY 24-28

Baltimore Aircoil Company, Inc. • 2623 Mathews Street • Baltimore 18, Maryland

LOOK WHAT CAN HAPPEN TO THE WOOD IN COOLING TOWERS

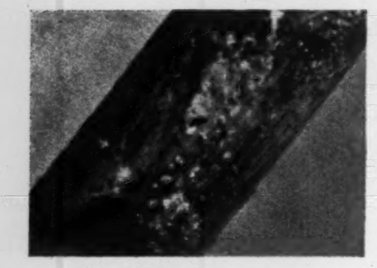
Unretouched photographs



Unprotected cooling tower redwood
RESULT OF CHEMICAL ATTACK

Unprotected cooling tower redwood
RESULT OF FUNGUS ATTACK

PRESSURE CREOSOTING ADDS YEARS OF LIFE TO HALSTEAD & MITCHELL COOLING TOWERS



FUNGUS ROTTED UNPROTECTED DECKING

Unretouched photographs

CLEAN PRESSURE-CREOSOTED DECKING

Examine these unretouched photographs carefully. Constantly wetted wood decking in a cooling tower is subject to immediate attack by fungus and marine parasites. It is also subject to chemical deterioration from acids in water. All wood used in Halstead & Mitchell Cooling Towers is protected against these twin enemies.

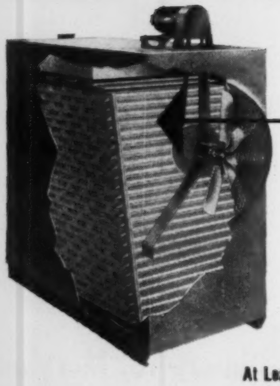
WHY PRESSURE CREOSOTING?

Creosote . . . *with 162 elements toxic to fungus growth and parasites* . . . also makes wood more resistant to chemical attack. Deep penetration of the wood by Koppers Pressure-Creosoting gives the longest possible wetted decking life. Therefore, all Halstead & Mitchell Cooling Tower decks are Pressure-Creosoted, and are guaranteed against rotting due to fungus growth . . . for 20 years!

ONLY HALSTEAD & MITCHELL OFFERS THE

20-Year Guarantee!

ON THE WETTED DECK SURFACE against rotting by fungus attack



2 thru 100 Tons

- Sheet-Steel Cabinets, 5-times protected
- Stainless Steel Fans and Shafts
- Weather Shielding
- Everdur Bolts for ease of disassembly at any time.

HM

Halstead & Mitchell

At Leading Refrigeration & Heating Wholesalers Everywhere

OFFICES: Bessemer Bldg., Pittsburgh 22, Pa.

On duct anchoring jobs...here's how you save with the

REMINGTON STUD DRIVER

Overhead work is fast and easy with the Remington Stud Driver. It weighs only 6 lbs.—requires no outside power source.

YOU SAVE TIME. With the Remington Stud Driver, you can set up to 5 fastening studs per minute in steel or concrete—each stud anchored solidly and permanently. This speed results from the tool's source of power, a 32 caliber cartridge. And its light weight (6 lbs.) and compact size make overhead duct work easier, less tiring.

YOU SAVE MONEY. Savings as high as 80% have been reported with the Stud Driver over old-style fastening methods. That's important with today's rising costs and means *you can bid lower, get more jobs!* And remember, the tool can be used on a wide variety of fastening jobs in addition to ducts . . . wood plates, pipe hangers, conduit and pipe clips and many others.

SEND COUPON BELOW. It will bring you our illustrated booklet on the Remington Stud Driver and show you how you can cut your fastening costs.

TYPICAL QUESTION FROM A CONTRACTOR

Q. *You said the tool pays for itself in a recent ad. About how many fastenings does it take to pay for it?*

A. *Purchase of a Remington Stud Driver, based on gross savings, can be justified with only a few hundred fastenings to concrete.*

MAIL THIS COUPON TODAY

Industrial Sales Division, Dept. HPAC-1
Remington Arms Company, Inc.
Bridgeport 2, Connecticut

Please send me my free copy of the new booklet showing how I can cut my fastening costs.

Name ______________________

Position ______________________

Firm ______________________

Address ______________________

City ______________ *State* ______________

"If It's Remington—It's Right!"

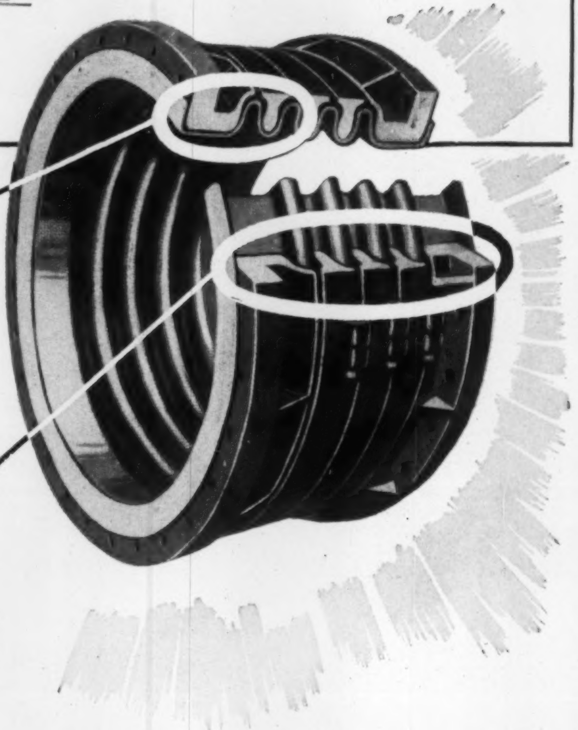
UL Remington DU PONT

Listed & Approved by Underwriters' Laboratories, Inc.

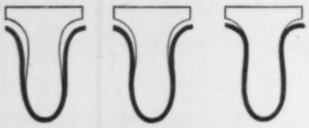
Badger

Expansion JOINTS

Typifying Expansion Joint Engineering at its Best



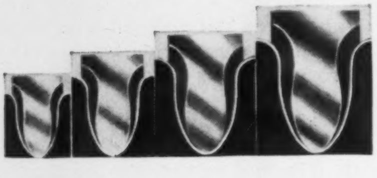
LONG-LIFE FEATURE



the ALL-CURVE, directed flexing, corrugation.*

LONG-LIFE FEATURE

PROPORTIONAL DEPTH of corrugation for each range of diameters and traverse.**



Badger Directed Flexing Self-Equalizing Expansion Joints give exceptionally long *service* life, proof of which has been well established in the City of New York where more than 4,000 of these Badger Joints are installed in the underground steam lines of the largest district heating company in the world.

*** The exclusive all-curve directed flexing corrugations and matching equalizing rings distribute the flexing stresses over the entire area of all corrugations.**

**** For each range of diameters there is a carefully calculated depth of corrugation with a defined limit of traverse.**

Each Badger Expansion Joint is originally designed with the proper number and depth of corrugations for maximum flexibility and service life at full rated traverse.

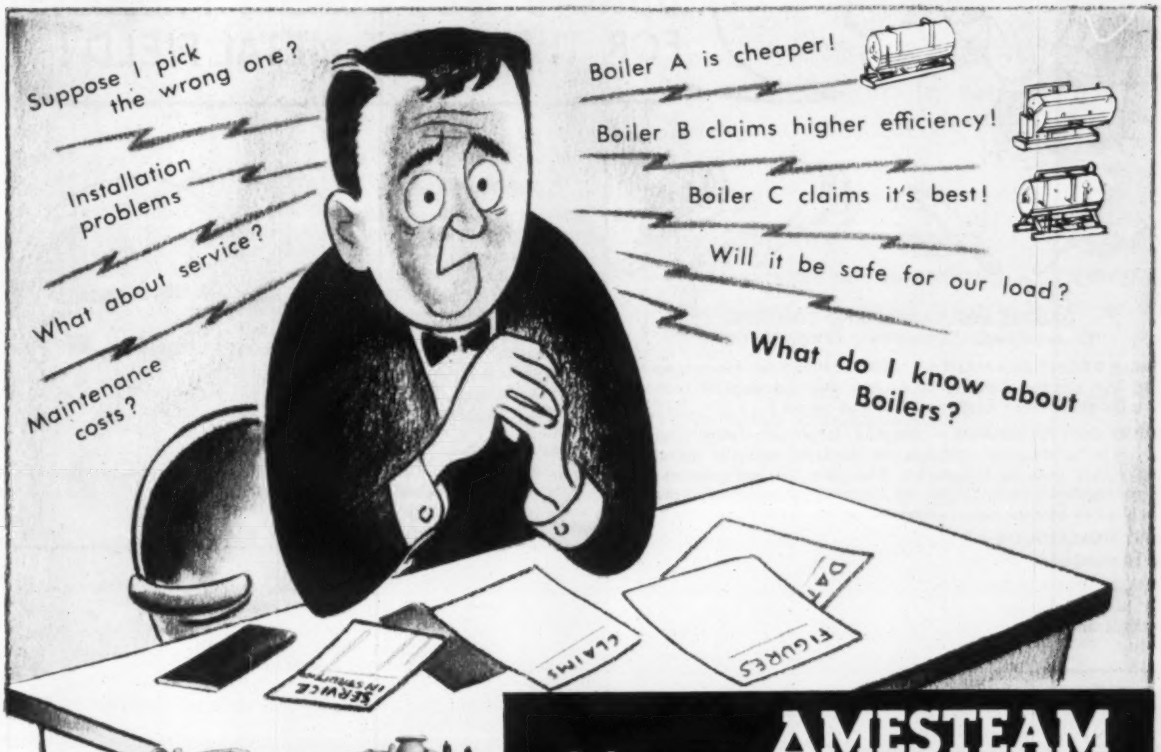
Remember — when you want long trouble free service in your distribution system, there is no substitute for the proper number and depth of corrugations. COMPARE BEFORE YOU BUY and to be sure you get the best, specify "BADGER".

BADGER MANUFACTURING COMPANY

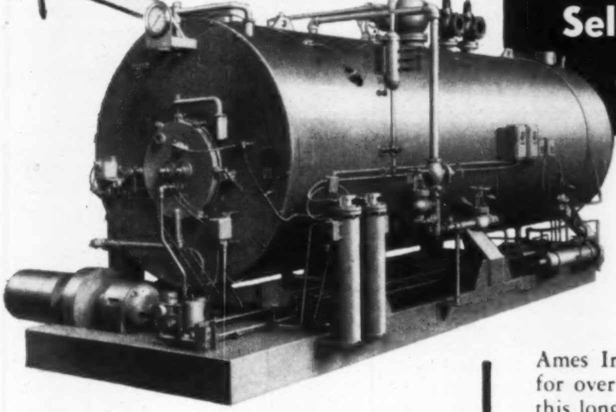
Original and Sole Manufacturer of Badger Expansion Joints

230 BENT STREET • CAMBRIDGE • MASS.

SO YOU HAVE TO BUY A BOILER!


Suppose I pick the wrong one?
Installation problems
What about service?
Maintenance costs?
Boiler A is cheaper!
Boiler B claims higher efficiency!
Boiler C claims it's best!
Will it be safe for our load?
What do I know about Boilers?
SERVICE INSTRUCTIONS
CLAIMS
FIGURES
DAT

Select an AMESTEAM GENERATOR and solve all your problems



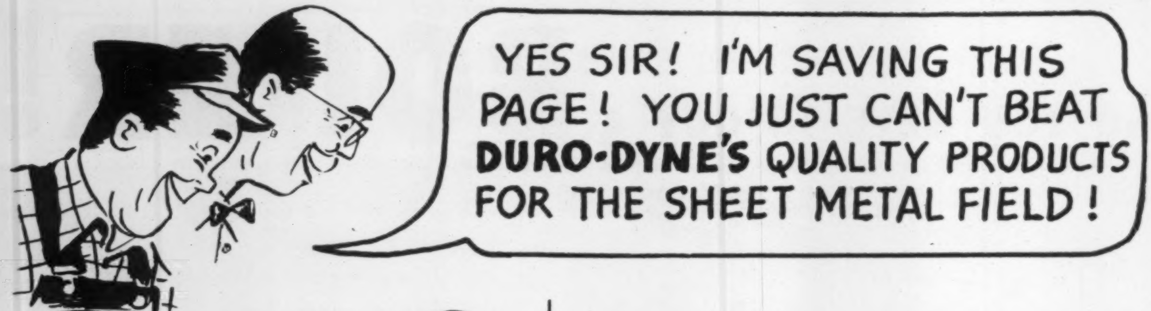
You don't have to dig through mountains of data to pick the boiler that will give your company the most economical and satisfactory service! It's more a question of *where* you buy it than what boiler you choose. What's the maker's reputation?

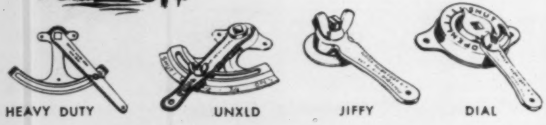
Ames Iron Works have been building boilers of quality for over 100 years. Back of every Amesteam Generator is this long, successful experience — represented by the Ames Engineering Staff, a large group of skilled boiler makers and an efficient, nation-wide sales and service organization at your disposal. Yes, quality and experience *do* count — and the thousands of Amesteam Generators giving dependable, low-cost service in power, process and heating applications are proof of it. Why not be *sure* by specifying Amesteam Generator? Write today for details and name of your Ames representative.

AMESTEAM GENERATOR

- 80% guaranteed thermal efficiency.
- Single economical package purchase.
- Package installation economy.
- Completely safeguarded.
- Easy, inexpensive maintenance.
- 20 sizes, 10 to 600 H.P., 15 to 200# W.P., oil, gas or oil-gas combinations with quick fuel switchover feature.

AMES IRON WORKS, INC.
BOX D-15, OSWEGO, N. Y.


YES SIR! I'M SAVING THIS PAGE! YOU JUST CAN'T BEAT **DURO-DYNE'S** QUALITY PRODUCTS FOR THE SHEET METAL FIELD!



DAMPER REGULATORS AND CONTROLS

(Formerly manufactured by PARKER-KALON)

UNXLD DAMPER QUADRANT SET — ⅜" size used for dampers up to 20", ½" size for dampers up to 30". Provides positive control. Sturdily constructed, easily installed and adjusted.

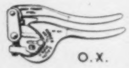
HEAVY DUTY QUADRANTS — Regulate larger size dampers up to 60". The ball bearing quadrants are the finest manually operated, heavy duty units on the market. The plain bearing quadrant for larger regulators up to 52" has the same rugged construction except for the ball bearing feature. Sizes ⅝" to 1".

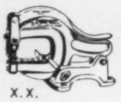
JIFFY REGULATOR SET — Installs more quickly since it does not have to be attached to the duct.

DIAL DAMPER REGULATOR SET — ¼" size for dampers up to 10"; ⅜" size for dampers up to 20". Special construction prevents air leakage and damper rattle. Made of heavy gauge steel, cadmium plated.

METAL PUNCHES

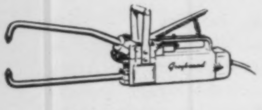
(Formerly manufactured by PARKER-KALON)


O.X.


X.X.

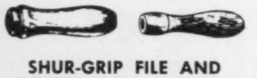
The O.X. Metal Punch is only 8" long and weighs 2⅝ lbs. It punches holes up to ¼" diameter in 14-gauge steel or its equivalent. Handle and frame are of finest steel forgings; all moving parts are precision made of tool steel, individually hardened and tempered. Supplied with 7 standard punches and dies from 3/32" to 17/64".

The X.X. Metal Punch is both a bench punch and a hand punch. By releasing a pin in the bench stand it becomes a hand punch. The X.X. has an extra large throat dimension — 3" deep x 2⅛" high. Handle and frame are of finest steel forgings, all moving parts are precision made of tool steel, individually hardened and tempered. Capacity is ¼" in 14-gauge metal or equivalent. Furnished complete with bench stand, gauge, stripper and one punch and die of any standard size, from 3/32" to 17/32" by 32nds.



GREYHOUND PORTABLE SPOT WELDER

The Greyhound Portable Spot Welder is a complete, self-contained unit that can be plugged into any outlet. It can be brought to the job. The Greyhound is ideal for air-conditioning and heating duct fabrication. Capacities to ⅛" combined thickness.

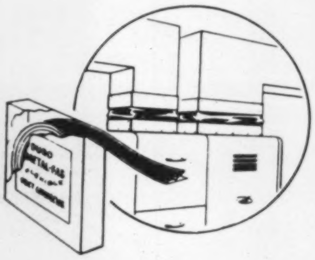


SHUR-GRIP FILE AND SOLDER IRON HANDLES

(Formerly manufactured by PARKER-KALON)

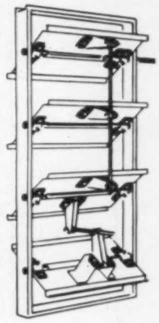
Shur-Grip File Handles screw onto the file and won't loosen. They contain a die which automatically cuts its own thread on the tang. They speed filing, prevent injuries. Sizes for 3" to 18" files. Shur-Grip Solder Iron Handles available for 1½ to 12-lb. irons.

DURO-METAL-FAB



Flexible duct connectors for stopping travel of vibration noises are made up to three times faster when fabricated from preassembled Duro-Metal-Fab. Metal strips are already attached to fabric, eliminating this costly, time-consuming step in the shop. The Double-Loc Seam assures a tight, permanent connection between fabric and metal. Metal is heavy gauge finest galvanized iron or aluminum. Fabric is U. L.-Approved canvas, heavy, tight weave asbestos or Neoprened Fiberglas. Supplied in continuous rolls containing 100 feet.

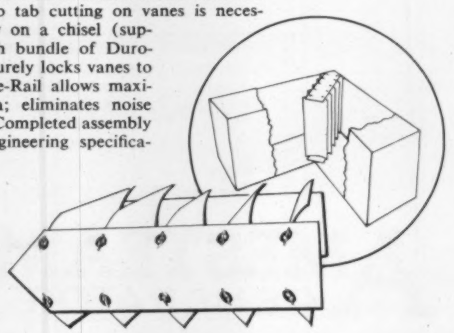
DURO BLADE KIT



Precision-built hardware for assembling multi-blade dampers. Reduces damper assembly time because of the uniformity of parts and the full adjustability which the kit provides. Damper blades are self-aligning, eliminating costly aligning procedures. Permits smooth, non-binding operation of dampers, even when a bracket is misplaced as much as ¼". Blade openings are individually adjustable; correct clearance between blade and damper is automatically provided. Approved for use on dampers for the major control manufacturers.

DURO-VANE-RAIL

Air turning vanes made with Duro-Vane-Rail save 50% to 70% in installed costs. Layout, drilling and riveting are eliminated. Vanes are sheared from scrap. No tab cutting on vanes is necessary. One blow on a chisel (supplied with each bundle of Duro-Vane-Rail) securely locks vanes to rail. Duro-Vane-Rail allows maximum free area; eliminates noise and "whistle." Completed assembly meets most engineering specifications.

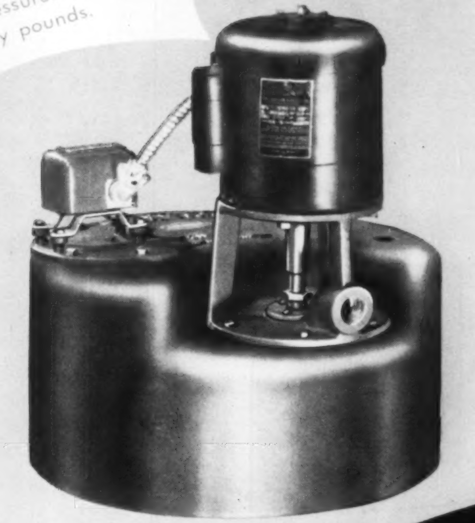


Sold by leading jobbers throughout the country.
WRITE FOR COMPLETE CATALOG

DURO-DYNE *Corporation* **800-D Third Avenue, New Hyde Park, N. Y.**

Skidmore Pumps . . for top performance

NOW!
New, wider range of discharge pressures — from ten to forty pounds.



There's a Skidmore Pump designed for each and every heating requirement.

SINGLE UNIT—TYPE "CV"

(LEFT) The Skidmore "CV" Vertical Unit is now offered in a wider range of selectivity. Light weight and compactly designed, this pump will perform with maximum efficiency in returning condensate to the boiler or other points of the system.

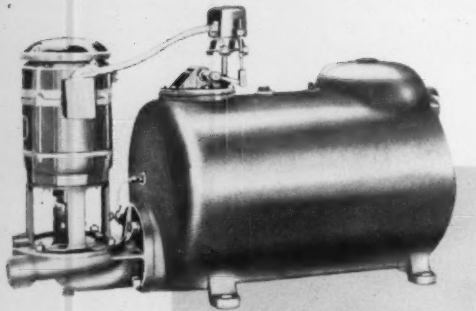
Here are the answers to— your Heating Pump Problems

DUPLEX UNIT—TYPE "CV"

(RIGHT) The Skidmore "CV" duplex unit is furnished in either the two float switch mechanism or automatic alternator. Pumps are complete with 18 gallon cast iron receivers. Capacities range from 50 to 10,000 sq. ft. E.D.R. and discharge pressures from 10 to 40 pounds.

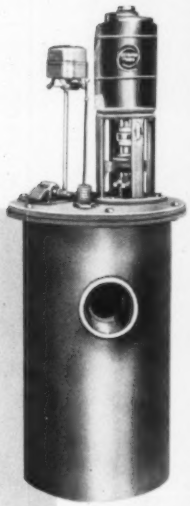
SKIDMORE
PUMPS

MAINTAINED
SKIDMORE
PUMPS
EFFICIENCY

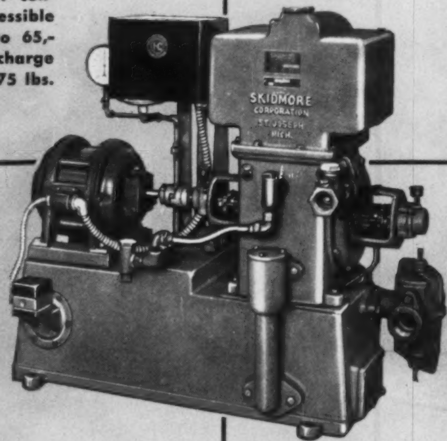


TYPE "VC" PUMP

This Skidmore Condensate Pump is sturdy cast iron construction—low inlet connection — easily accessible — capacities, 1,000 to 65,000 sq. ft. E.D.R. discharge pressures from 10 to 75 lbs.



Designed for low return installations — pump is bolted to sump type receiver—capacities, 2,000 to 40,000 sq. ft. E.D.R. and discharge pressures from 10 to 75 lbs.

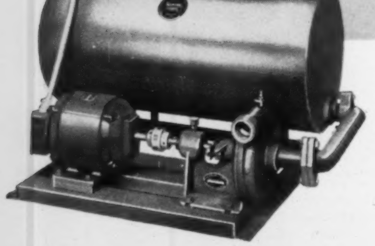


SKIDMORE VACUUM PUMP—SINGLE UNIT
(ALSO FURNISHED IN DUPLEX)

MAINTAINED EFFICIENCY
. . . automatically adjusts itself to the varying conditions.

Low return lines . . . reduces installation cost, often eliminating the necessity of a pit.

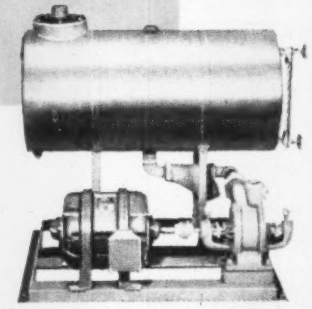
Capacity remains constant year after year . . . eliminates adjustments and costly repairs.



TYPE "HS" PUMP

Sturdily constructed for dependable service at small investment —capacities, 1,000 to 65,000 sq. ft. E.D.R. discharge pressures from 10 to 75 lbs.

SKIDMORE
PUMPS



TYPE "TM" PUMP

Completely assembled on either steel or cast iron base — capacities, for boilers up to 250 H.P. discharge pressures to 150 lbs.

SKIDMORE PUMPS have set a standard for performance and dependability since 1921.

Skidmore Heating Pumps are designed in both single and duplex units

Write for Bulletins

SKIDMORE CORPORATION

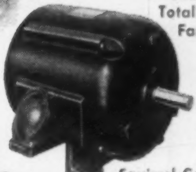
ST. JOSEPH, MICHIGAN

It's top-quality equipment if it has . . .

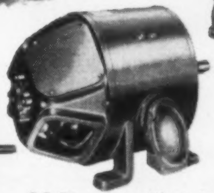
ELLIOTT CROCKER-WHEELER MOTORS

Squirrel-Cage
Drip-proof Type
Splashproof Type

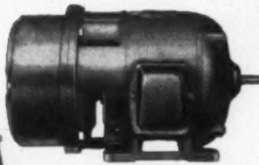
"Sealedpower"
Totally-Enclosed
Fan-cooled



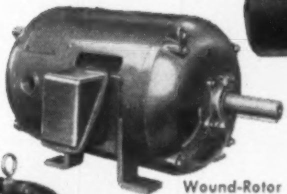
Squirrel-Cage
Totally-Enclosed
Non-Ventilated



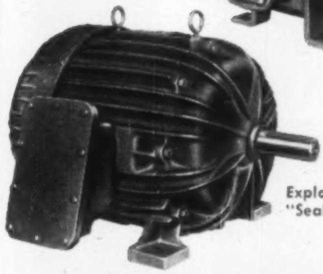
DC Open Type (illustrated), Drip-proof.
Also Drip-proof Guarded



Brake Motor



Wound-Rotor
Drip-proof Type

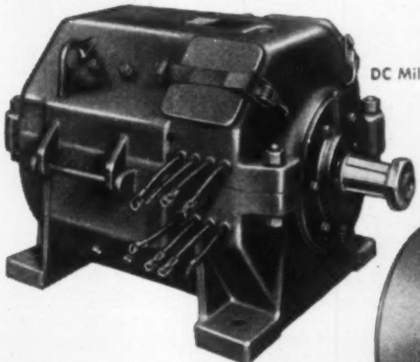


Explosion-Proof
"Sealedpower"

• Like the sterling mark on silver, an Elliott Crocker-Wheeler motor on a machine tool, pump, fan, textile machine, is a positive indication of the quality which the machine builder has put into his product.

The Elliott C-W line of integral motors is complete, covering a range of 1 to 200 hp, all types available including the new Elliott C-W Gearmotor.

Your local Elliott representative will give you all the facts—or write Elliott Company, Crocker-Wheeler Division, Jeannette, Pa.



DC Mill Motor

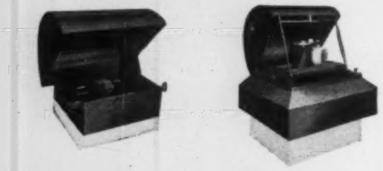
ELLIOTT Company
CROCKER-WHEELER DIVISION

Gearmotor.
Single reduction
with brake.

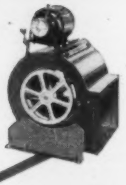
W3-11

The MASSACHUSETTS *Line*®

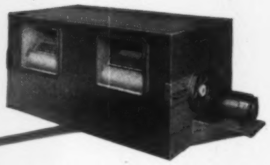
OUR 76TH YEAR



POWER ROOF VENTILATORS, Propeller Fan Type and Power Fixed (backward curve blade) offer a wide range of sizes. Bulletin No. 119 Propeller Fan Type Bull. 124 Power Fixed Fan Type.



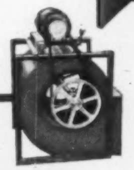
BLOWERS, Squirrel Cage (Forward Curve) and Power Fixed (Backward Curve) Fans available in a complete range of sizes, Single or double width. Bulletin 101 (PF) Bulletin 105 (S.C.).



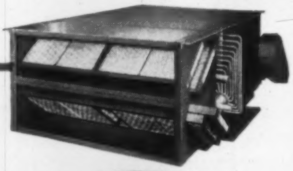
FURNACE FANS, Single, double or special width. All housing and wheel parts are die formed. Available as complete assemblies or parts only. Bulletin No. 115.

UNIT HEATERS, Blower Type floor or ceiling mounting arrangements, built in sections to facilitate efficient handling and erection. Popular sizes. Bulletin No. 112.

PROPELLER FANS, New Venturi-type Belt drive 24″ to 48″ wheel diameters, direct drive 12″ to 30″ diameters. A complete line of accessory items are available. Bulletin 117.

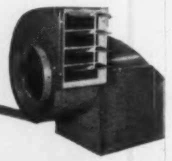


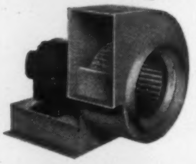
UNIVERSAL BLOWERS, A stock blower assembly made in single or double width, sizes 7″ to 27″ wheel dia. and features Universal discharge arrangement. Bulletin No. 110.



AIR CONDITIONING UNITS, Seven sizes available, ranging from 1,000 to 14,000 C.F.M. Vertical or horizontal mounting. Designed to combine cooling in summer, heating in winter. Bulletin 120.

VENTILATING SETS, Utility type. Belt drive wheel diameters 7″ to 30″. Direct drive 6″ to 13½″. Both available in popular competitive sizes, self contained completely packaged units. Bulletin 109.





MASSACHUSETTS BLOWER DIVISION

The BISHOP & BABCOCK *Mfg. Co.*

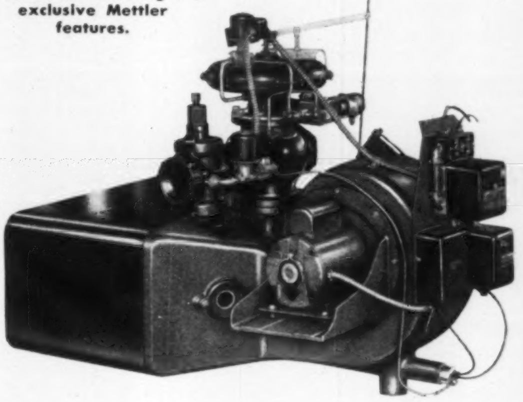
4901 HAMILTON AVENUE CLEVELAND 14, OHIO

Mettler "FAN-AIR" and Companion

AUTOMATIC
MECHANICAL DRAFT
"PACKAGED"

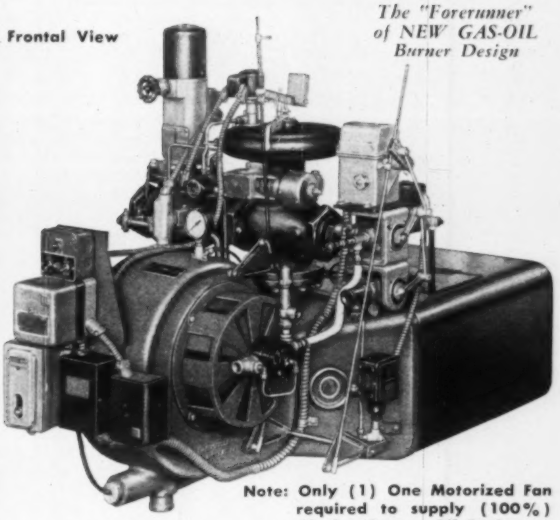
GAS BURNERS DUAL FUEL BURNERS

Picturing a few popular assemblies revealing the exclusive Mettler features.



Frontal View

The "Forerunner" of NEW GAS-OIL Burner Design



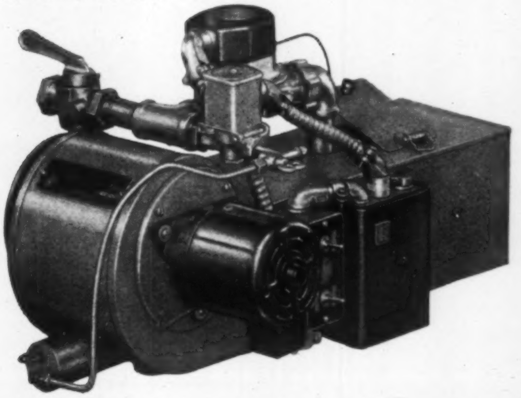
Note: Only (1) One Motorized Fan required to supply (100%) Air for Gas or Oil Fuel

Model 32F-3 - Gas Burner - 250 H.P.

New 1955 Model features automatic safety pilot and triple controls. Not just a burner, but a COMPLETE and FULLY AUTOMATIC GAS BURNER SYSTEM, factory tested and ready for application when received. Furnished complete as pictured, with simple dependable automatic "On and Off" or modulating controls. Burner and controls WITH SPARK IGNITION and FLAME SAFEGUARDS are scientifically coordinated to provide INSTANT FUEL SHUT-OFF on FLAME FAILURE—MEETING APPROVAL REQUIREMENTS. 12 sizes, 5 to 500 H.P.

Model MGO-5D4 - Gas or Oil - 250 H.P.

A fully automatic mechanical draft burner employing the ENTRAINED COMBUSTION PRINCIPLE operates equally efficiently with any gas or No. 2 to No. 5 Fuel Oil. A **"flip of the switch"** or automatic remote control changes from Gas to Oil or in reverse. Nothing else like it on the market. Another example of Mettler Leadership designed to fill the trend and need of the Gas Industry for peak-load emergencies.

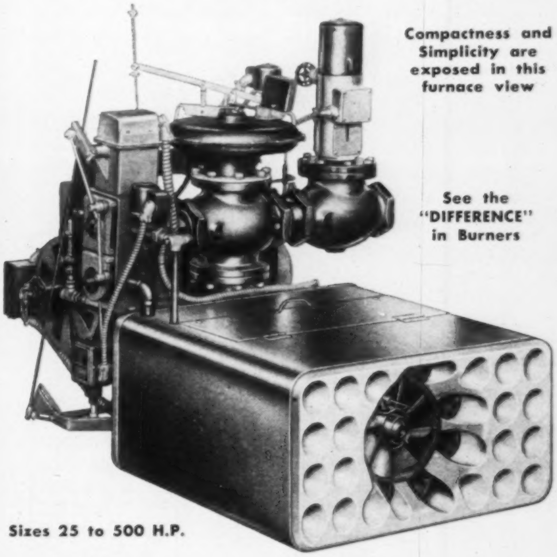


Model 4F-R - Compact Low-Price Gas Burner

Another new current development designed for those small difficult jobs where price is a factor. The smallest model in the Mettler Series, this burner has all the outstanding "Fan-Air" features. The efficiently designed single burner unit has a full capacity range from 100,000 to 600,000 BTU hourly input. **WHY BE SATISFIED WITH-LESS.**

Compactness and Simplicity are exposed in this furnace view

See the "DIFFERENCE" in Burners



Sizes 25 to 500 H.P.

Listed by Underwriters' Laboratories, Inc.

ALL BUILT ON THE *"Entrained Combustion"* PRINCIPLE • THE "FAN-AIR" MGO SERIES IS WORTHY OF YOUR SPONSORSHIP • PROMPT SHIPMENTS ASSURED • WRITE FOR DETAILS.

EXPERTO CREDE*

**4366
WORTH STREET**

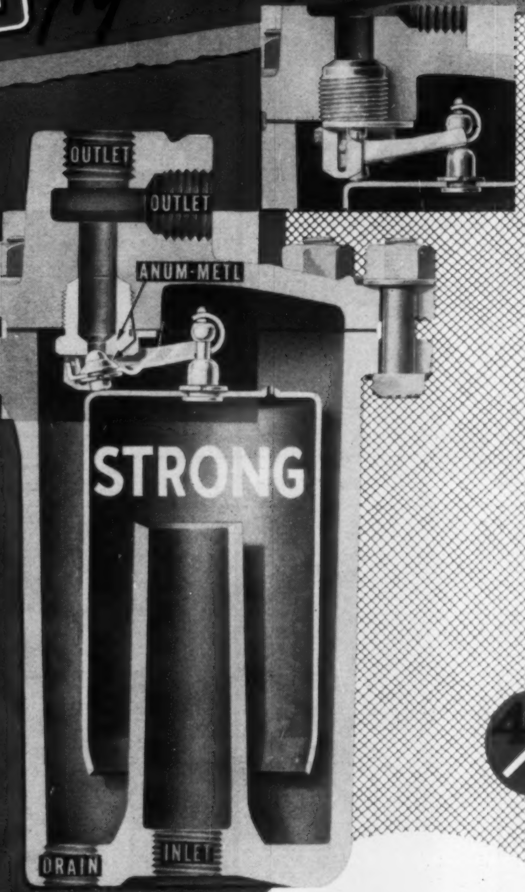
THE METTLER CO. INC.
DIV. ECLIPSE FUEL ENG. CO.

**LOS ANGELES 63
CALIFORNIA**

*TRUST ONE WHO HAS HAD EXPERIENCE — A RECOGNIZED TRADEMARK SINCE 1922

announcing the NEW

STRONG *Hydro-Flex* STEAM TRAPS



FOR LOW AND HIGH PRESSURE SERVICES TO 2500 PSI and 1100° F

GREATER CAPACITY

LOWEST MAINTENANCE

UNMATCHED OPERATION ON LIGHT LOADS

Here is a new standard of performance in steam traps—Strong "Hydro-Flex"!

This completely new line of low, medium and high pressure steam traps combines high discharge capacity with high efficiency under all condensate loads. This built-in flexibility can mean lower steam and maintenance costs plus higher production.

Strong "Hydro-Flex" meets the need for a trap that operates efficiently on light condensate loads. Under normal plant conditions many traps actually function at less than 1% of rated capacity. Strong's "Hydro-Flex" design makes possible high discharge rates when required, yet assures unequalled performance on low loads. This new concept in steam traps is the product of five years of development work and 50 years of steam trap experience.

Take advantage of this new, better standard of steam trap economy—standardize on Strong "Hydro-Flex". For complete details, contact your local Strong distributor or write for new Catalog No. SS-40.

4/S

STRONG

HYDRO-FLEX

STEAM TRAPS

high efficiency under all condensate loads

Available from over 200 industrial distributors in the United States, Canada and foreign countries.

STRONG, CARLISLE & HAMMOND CO.
1392 WEST 3rd STREET • CLEVELAND 13, OHIO

SEE OUR EXHIBIT, BOOTH [illegible], 12TH INTERNATIONAL HEATING AND VENTILATING EXPOSITION

SelecTemp room units, only 18 inches high, are recessed into wall and can be painted to match color scheme. Three sizes: 6,000, 12,000, and 18,000 Btu output. 12,000 Btu size shown below. No electric wiring or power is used. Small flexible copper tubes carry steam to each room unit.

Why Iron Fireman® SelecTemp® is the greatest advance in modern heating

This Quick Quiz Tells Story

Features never before available bring new heating standards to apartments, hospitals, motels, office buildings, schools and other buildings of every size and type.

Q. What features are new and better in Iron Fireman SelecTemp heating?

A. (1) Thermostat in every room; (2) modulated (not "on-off") heat; (3) filtered warm air continuously circulated; (4) easily installed in new or old construction; (5) boiler can be located anywhere; (6) moderate operating costs.

Q. How does SelecTemp provide individual room temperature control?

A. Each room heating unit has its own thermostat. Temperature in any room, including bathrooms, can be raised or lowered without affecting temperature in any other rooms.

Q. What is meant by "modulating" heat?

A. SelecTemp is not "on-and-off" heating. Each room unit automatically modulates its own heat output. Steam turbine operated fan in each unit runs faster or slower, according to amount of heat needed, gently circulating filtered warm air.

Q. What happens when south rooms face warm sunshine and north rooms face cold winds?

A. SelecTemp heaters in the rooms affected act at once, adjusting heat output to the needs of the individual rooms. Heating units on the warm side of the building slow down to compensate for solar heat, while those on the cold side increase heat delivery to make up for extra heat loss. SelecTemp units mounted in outside walls quickly sense temperature changes and automatically increase room temperature to keep comfort level constant. Reaction is fast and accurate—no outside thermostats required.

Q. Is SelecTemp reasonable in cost?

A. Yes. The system is engineered for very economical installation and operation, both in new construction and modernization. SelecTemp, a new, different and revolutionary kind of heating, is one of the most desirable features you can put into any type of building where human comfort is involved.

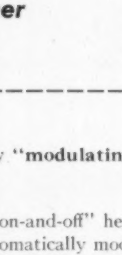
SEND FOR FREE SELECTEMP BOOKLET . . .

Contains complete description, with specifications for builders and architects. Use coupon below.

Iron Fireman

SelecTemp®

MODULATING ZONE HEATING



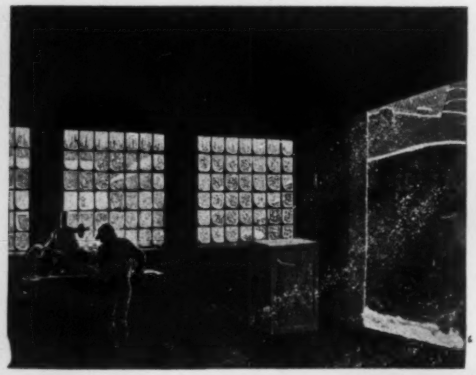
Iron Fireman Manufacturing Company
3058 W. 106th St., Cleveland 11, Ohio.
In Canada: 80 Ward St., Toronto, Ontario.

Please send free descriptive booklet on SelecTemp heating.

Name

Address

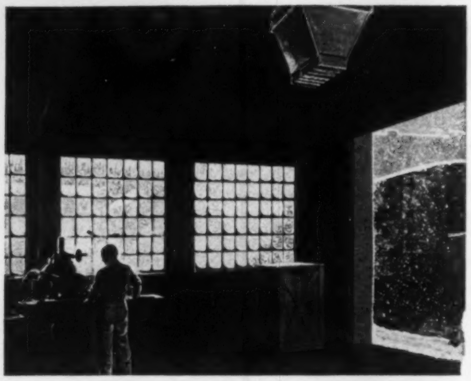
City State

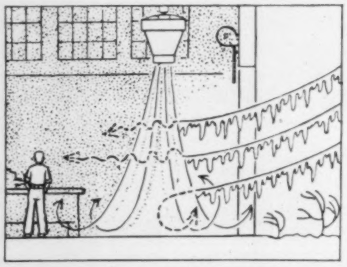


WINTER!

Keep Production Moving with

WING DOOR HEATERS





A curtain of warm air tempers the incoming icy blasts to a comfortably warmed current of air.

Write today for a copy of Bulletin DH-1.

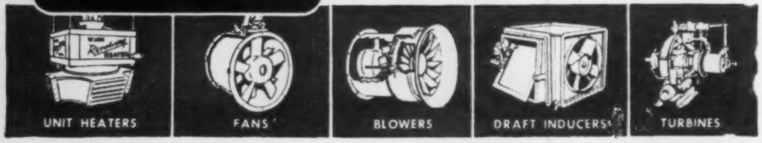
Cold blasts from open doors are stopped in their tracks by Wing Door Heaters, which go into action automatically when the door is opened. The high velocity curtain of warm air keeps working areas comfortable, preventing the chilly drafts from entering. Workers are healthier, happier, keep right on working when doors are open. Learn how easily Wing Door Heaters can be installed in your plant.

L. J. Wing Mfg. Co.

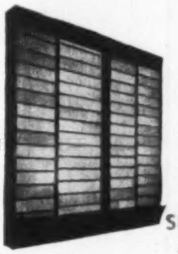
140 Vreeland Mills Road
Linden, N.J.

Factories at Linden, N.J. and Montreal, Can.
In Europe: Etab. Wanson, Brussels, Belgium

Wing



CONTINENTAL has a "round-the-world" reputation for trouble-free air filtration

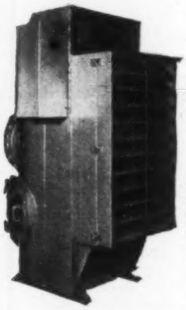


SELF-CLEANING AUTOMATICS

Patented media design and unique "soak-then-flush" action provide thorough self-cleaning. Ferris-wheel feature eliminates reversing media to direction of air flow in back curtain—no dust can be blown back into clean air stream.

CA-24 DYCON

Oil-free, synthetic fiber media of this deep-bed (8") unit filter effectively traps and holds dust by accumulated static charge. Large dust-holding capacity. Choice of various media blankets to provide degree of efficiency desired. Easily rinsed for re-use—cuts maintenance costs.



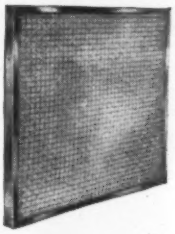
HEAVY DUTY ENGINE AIR INTAKES

All advantages of Continental's Self-Cleaning Automatics assure maximum protection with minimum maintenance cost and effort.

E-Z-WASH UNIT FILTERS

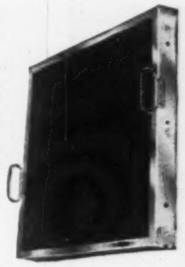
Continental's patented media assures high efficiency, easy washing, freedom from clogging, and exceptional dust-holding capacity.

AIR
CONTINENTAL
FILTERS



TYPE DY DYCON

Permanent 1" synthetic fiber filter in rust-proof aluminum frame easily rinses clean under open water faucet or nozzleless hose. Exceptional dust-holding capacity means infrequent servicing. Made in any desired size.



E-Z-WASH GREASE FILTERS

All aluminum highly efficient, permanent-type filters for kitchen exhaust systems. Easily washed—once through an automatic dishwasher and they are like new again.

CA-20

Oil-free, synthetic fiber media of this deep-bed (4") unit filter effectively traps and holds dust by accumulated static charge. Large dust-holding capacity. Choice of various media blankets to provide degree of efficiency desired. Easily rinsed for re-use—cuts maintenance costs.

E-Z Oil
Air Filter Oil

E-Z-OIL AEROSOL BOMB

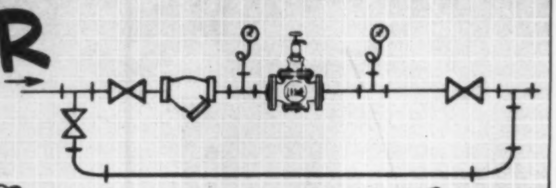
For simple finger-tip re-oiling of viscous-type unit filters after washing.

WRITE for catalogs, estimates . . . or contact the CONTINENTAL Sales Representative in your city.

CONTINENTAL AIR FILTERS, Inc.

P. O. BOX 1647
•
LOUISVILLE 1
KENTUCKY

WHEN TO USE A REGULATOR



SELF-CONTAINED PRESSURE, TEMPERATURE AND PUMP PRESSURE REGULATORS

Leslie Self-Contained Regulators are spring loaded, internal pilot, piston or diaphragm operated with stellited seating surfaces, hardened stainless steel main valves and renewable wearing parts of heat treated stainless steel of grades best suited to the application.

Regulators are used for any one or any combination of the following conditions:

★ When quick response is necessary to handle sudden load changes.

★ When available fluid pressure supplies sufficient differential for self operation.

★ When positive dead end shutoff is required for short periods of time.

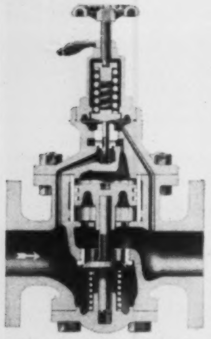
★ When one-step pressure reductions are desired.

★ When service conditions require continuous flow for varying demand.

★ When "instrument control" is required without auxiliary operating force.

★ When installation requires smallest physical dimensions.

★ When operation from either a nearby or a remote control station is desired.

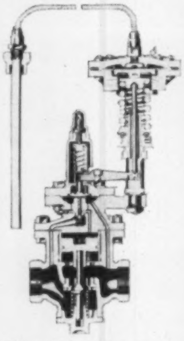


Pressure Reducing Valve
Class L-3

LESLIE PRESSURE REDUCING VALVES

Automatically maintain a constant reduced pressure of steam, air or gas. Single seated, tight closing. Respond instantly to load changes. Renewable, interchangeable parts. Stellited seating surfaces. Complete overhaul permitted without removing body from pipe line. Made in bronze, cast iron, cast steel or cast alloy steels. Sizes ½" to 6". Other units available for constant differential pressure, unloading, and for remote adjustment. Inlet pressures 25 psi to 1500 psi steam at 950°F. Reduced pressures 2-600 psi.

SEND FOR BULLETIN 5302



Temperature Regulator
Class LTCO

LESLIE TEMPERATURE REGULATORS

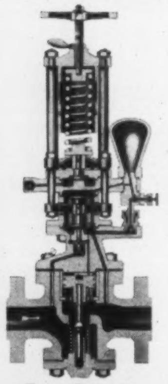
Designed for a wide range of applications. Vary the flow of steam or cooling water to heater or process to automatically maintain constant temperature. Rugged 100° F. adjustable range thermostatic element. For small and large flows, direct operated, direct and reverse acting or with "Duomatic", two-element (pressure and temperature) control. For driers, fuel oil heaters, instantaneous and storage heaters, kettles, open tanks, ovens, process heaters, degreasing machines, steam tables, sterilizers, storage heaters, urns, etc.

SEND FOR BULLETIN 5307

LESLIE PUMP PRESSURE REGULATORS

Accurately and automatically control discharge pressure from steam operated, reciprocating or turbine driven pumps. Single seated—positive—responsive and accessible. No packed plungers or stuffing boxes. Built for constant discharge pressures of 8 psi to 2000 psi and excess pressure of 10-200 psi. For motor-driven pump discharge pressure recirculation.

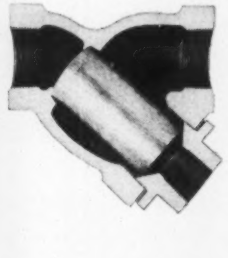
SEND FOR BULLETIN 5306



Pump Governor
Class CTHS-3

LESLIE SELF-CLEANING STRAINERS

Recommended to protect all regulating equipment from dirt and foreign matter. Cast iron, bronze, cast steel, carbon moly, chrome-moly, stainless and forged steels. Strainers with screwed, flanged, socket and butt welded connections; sizes ⅛" to 10" inclusive. Primary service ratings to 2500 psi. Screens furnished in Monel and stainless steel with various perforations and meshes for liquid, gas, air, oil and steam services. For complete details on each type, ask for Bulletin 5308.



Self-Cleaning Strainer

3188

LESLIE REGULATORS

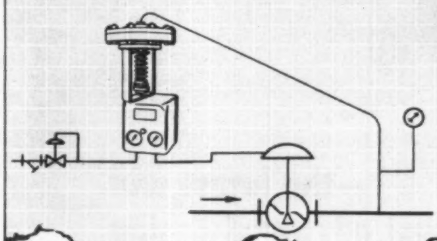
TRADE LESLIE MARK

SINCE 1900

LESLIE CO., 237 GRANT AVENUE · LYNDHURST, N. J.

"STILL FAR AHEAD IN QUALITY AND PERFORMANCE"

WHEN TO USE A CONTROLLER



PRESSURE, TEMPERATURE AND LIQUID LEVEL CONTROLLERS

Leslie Controllers consist of a single or double seated diaphragm control valve operated by a Control Pilot. The latter is an air, water or oil actuated device that produces a variable loading pressure to the valve diaphragm in response to a pressure, temperature or level change in the controlled medium. Controllers are used for any one or any combination of the following conditions:

★ When an exactly controlled level, pressure or temperature is required.

★ When power is needed to assure automatic valve opening after prolonged, tight shut-off.

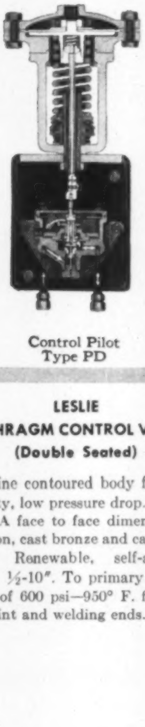
★ When power is needed to operate single-seated valves under high pressure drop.

★ When the available fluid pressure differential doesn't supply enough power for self-operation.

★ When extreme pressure reductions are necessary (i.e. 600 reduced to 10 psi, 900 to 2 psi, 2150 to 5 psi); all can be handled in one step.

★ When fluid contamination requires the simplest type regulating valve for dependable operation.

★ When operation from either a nearby or remote control station is desired.

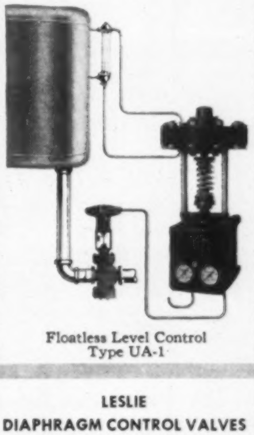


Control Pilot
Type PD

LESLIE CONTROL PILOTS

Simple mechanical device employing constant supply of clean air, gas, water or light oil at 20-22 psi to produce a variable output or loading pressure of 0-20 psi in response to a level, pressure or temperature change applied to operate a control valve or power cylinder controlling fluid flow.

SEND FOR BULLETIN 5303



Floatless Level Control
Type UA-1

LESLIE FLOATLESS LEVEL CONTROL

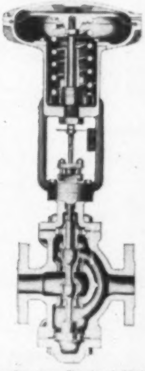
Provides accurate control of liquid level (plus or minus 1" water column). Eliminates problems caused by troublesome linkages, torque tubes, floats and stuffing boxes. Simple design provides steady, positive, precise control even under difficult conditions. Consists of Level Control Pilot and diaphragm control valve.

SEND FOR BULLETINS
5303, 5304, 5305

LESLIE DIAPHRAGM CONTROL VALVES (Double Seated)

Flow-line contoured body for high capacity, low pressure drop. Standard ISA face to face dimension in cast iron, cast bronze and cast alloy steels. Renewable, self-aligning guides. ½-10". To primary service rating of 600 psi—950° F. flanged, ring joint and welding ends.

SEND FOR BULLETIN 5305

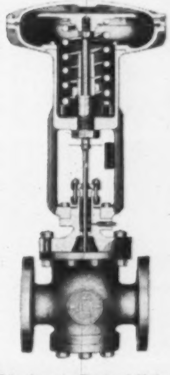


Diaphragm Control Valve
Double Seated Class DV

LESLIE DIAPHRAGM CONTROL VALVES (Single Seated)

Control flow of steam, liquid, air or gas. Tight shut-off. Operated automatically by air, water or oil pressure supplied from a Control Pilot or from a loading device such as LESLIE Air Loading panel. Available in unbalanced or fully balanced types, ½-10" in cast bronze, cast iron and cast alloy steels. Primary service ratings to 2500 psi, 1000° F.

SEND FOR BULLETIN 5304



Diaphragm Control Valve
Single Seated Class DL -1

3108

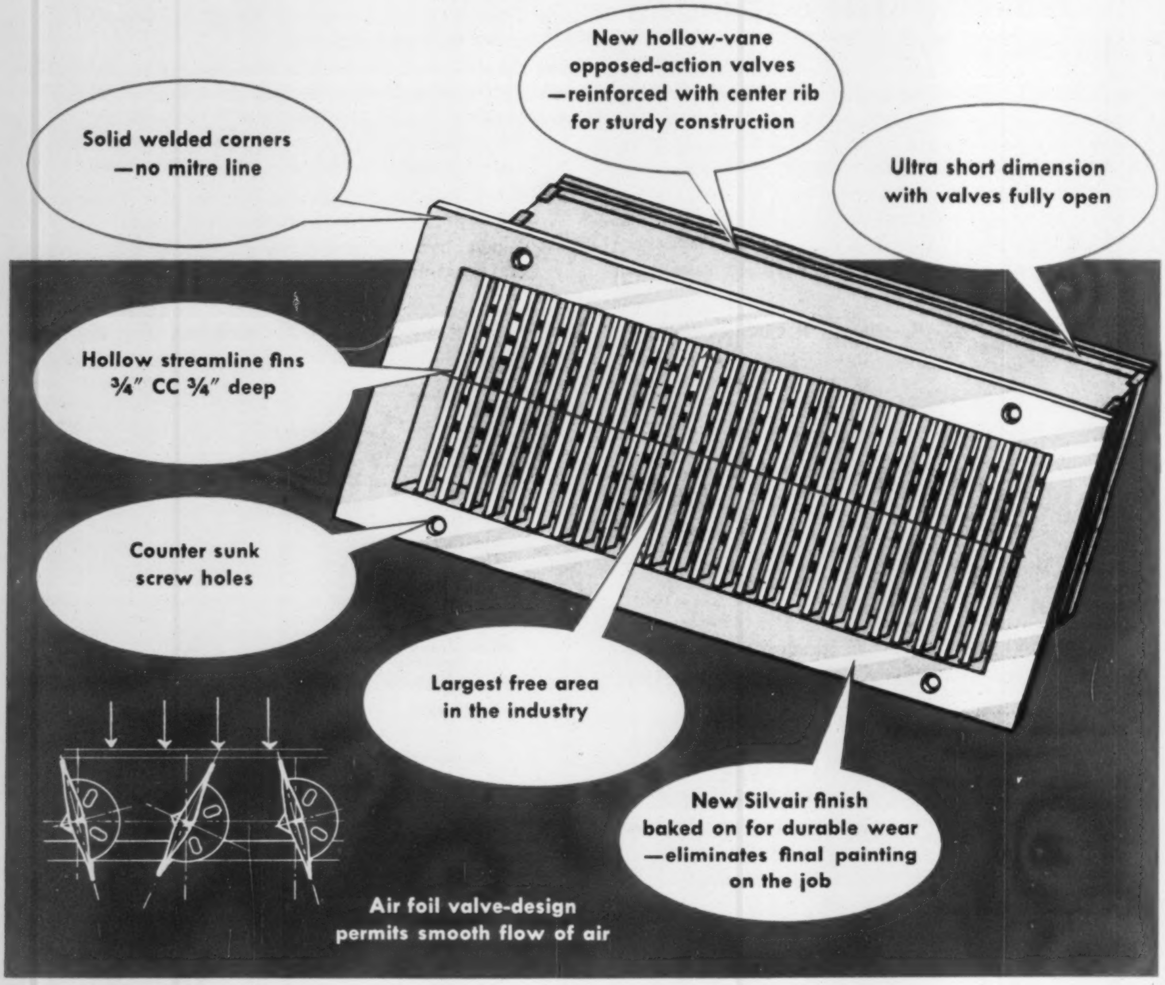
LESLIE TRADE LESLIE MARK **CONTROLLERS**

SINCE 1900

"STILL FAR AHEAD IN QUALITY AND PERFORMANCE"

PRESENTING

—the latest and most advanced design in air conditioning registers and grilles



Solid welded corners —no mitre line
New hollow-vane opposed-action valves —reinforced with center rib for sturdy construction
Ultra short dimension with valves fully open
Hollow streamline fins ¾″ CC ¾″ deep
Counter sunk screw holes
Largest free area in the industry
New Silvair finish baked on for durable wear —eliminates final painting on the job
Air foil valve-design permits smooth flow of air

Write for Catalog No. 55

Stewart MANUFACTURING COMPANY, INC.

CEDAR GROVE, ESSEX COUNTY, NEW JERSEY

REPRESENTATIVES IN PRINCIPAL CITIES • IN CANADA — AIR-CARE, LTD., MONTREAL

Atmospheric Spray
Horizontal Draft (Package)
Induced Draft

THE *Leader All Ways* IN *Fine Cooling Towers*

An Unmatched Experience Record of 57 Years, as Exclusive Builders of the World's Finest Cooling Towers

Founder Member of C. T. I.

LILIE-HOFFMANN
Cooling Towers
4239 DUNCAN AVE. • ST. LOUIS, MO.

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Super-Dry Refrigerants

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genetron

REFRIGERANTS:

- Super-Dry: guaranteed exceptionally low moisture content
- Non-corrosive to standard equipment materials
- Non-toxic, non-flammable, stable, safe
- Critical and freezing points are well outside range of operating uses
- Solvent action on oil helps prevent solidification or congealing of lubricant
- Miscible with oil; aid in lubrication of equipment

genetron 11—ORANGE LABEL
TRICHLOROMONOFLUOROMETHANE

genetron 12—WHITE LABEL
DICHLORODIFLUOROMETHANE

genetron 141—GREEN LABEL
MONOCHLORODIFLUOROMETHANE

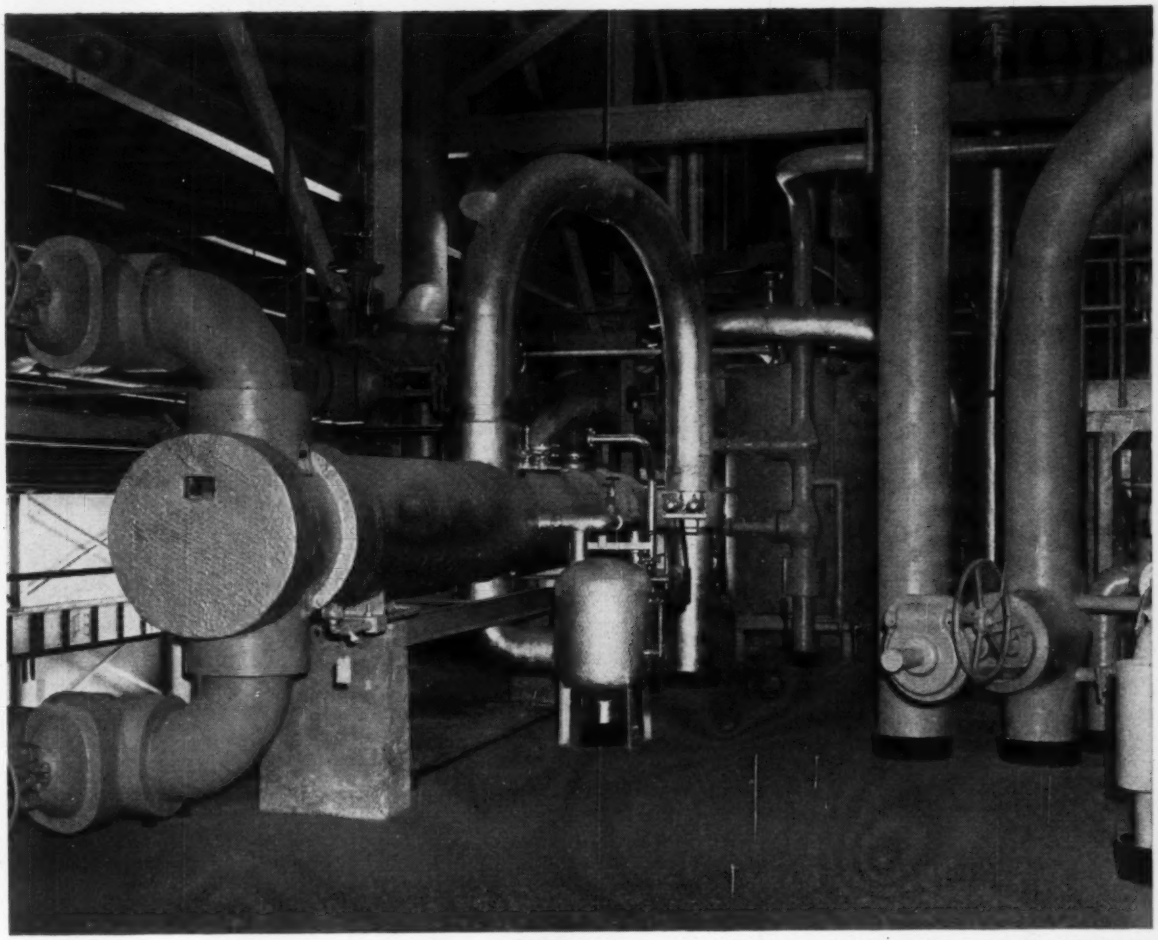
For further information on "Genetron" *Super-Dry Refrigerants*—see your wholesaler, or write or phone any General Chemical office listed below.

GC
Allied Chemical

VISIT BOOTH S95-97
at the Air Conditioning Exposition,
Philadelphia. January 24-28.

GENERAL CHEMICAL DIVISION
ALLIED CHEMICAL & DYE CORPORATION
40 Rector Street, New York 6, N. Y.

Offices: Albany • Atlanta • Baltimore • Birmingham • Boston • Bridgeport • Buffalo • Charlotte
Chicago • Cleveland • Denver • Detroit • Greenville (Miss.) • Houston • Jacksonville • Kalamazoo
Los Angeles • Minneapolis • New York • Philadelphia • Pittsburgh • Providence • San Francisco
Seattle • St. Louis • Yakima (Wash.)
In Wisconsin: General Chemical Company, Inc., Milwaukee
In Canada: The Nichols Chemical Company, Limited • Montreal • Toronto • Vancouver



This evaporator-condenser unit in a modern power plant is insulated with "Featherweight" 85% Magnesia.

"Featherweight" 85% Magnesia insulation conserves heat and dollars

"Featherweight" 85% Magnesia (85% basic carbonate of magnesia and asbestos fiber) effectively insulates piping and equipment with temperatures up to 600° F. Used with a primary layer of K&M Hy-Temp Insulation (Diatomaceous Silica), the combination is effective up to 1900° F. The application of these two layers—with staggered joints—eliminates the heat loss that normally occurs when expansion causes the joints to open in single layer installations.

These K&M insulations last the life of the equipment they serve. They withstand moisture, vibration and frequent temperature changes.

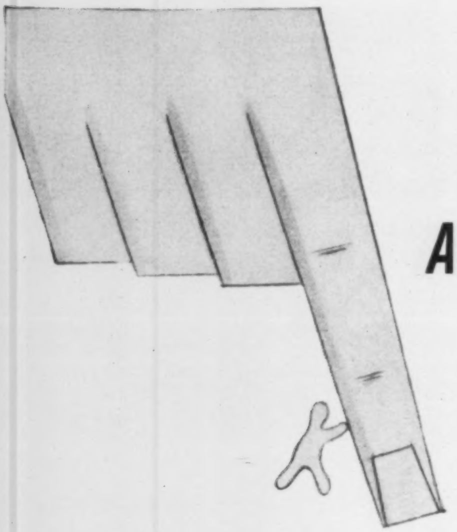
New and now available is "Featherweight" Water-Resistant Magnesia Insulation for temperatures up to 450° F. It is used underground where severe water exposure may damage the insulation or on indoor steam heated lines and equipment where high humidity and moisture are present.

For more information on these heat-saving, money-saving K&M insulations, contact your K&M distributor who is an experienced applicator. Or write directly to us.

KEASBEY & MATTISON COMPANY · AMBLER · PENNSYLVANIA

Nature made asbestos . . . Keasbey & Mattison has made it serve mankind since 1873

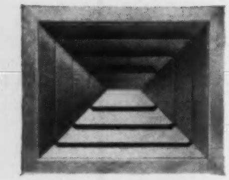
K&M best in asbestos ®



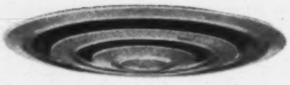
Put your finger on correct *AIR HANDLING* Equipment

AGITAIR®

for better air

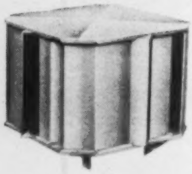


Square, Rectangular
and Continuous Diffusers



Circular
Adjustable and Non-Adjustable
Diffusers

Stripline
Sectional and Continuous
Diffusers



Exhausters

High Velocity
Air Filters

On Display at Booth 533

From drawing board to finished product, every AGITAIR is designed and built to provide dependable operation, maximum efficiency, minimum maintenance and years of continuous carefree service. And where AGITAIR engineering ends... AGITAIR technical service begins... to help you select the proper shapes and sizes to meet your particular requirements.

Contact your local AGITAIR representative—let him put your finger on the correct diffuser, filter or exhauster.

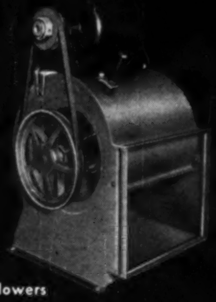
AIR DEVICES INC.

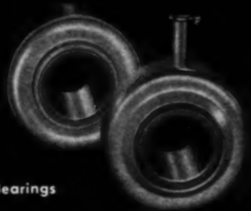
185 MADISON AVENUE, NEW YORK 16, N. Y.

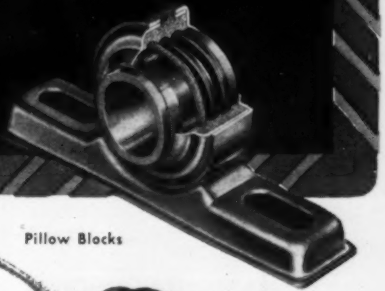
AIR DIFFUSERS • FILTERS • EXHAUSTERS

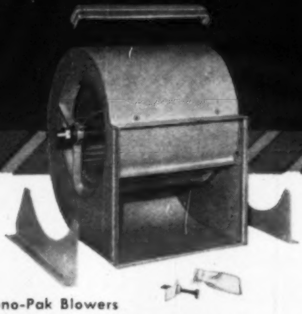
LEADERS RELY ON LAU

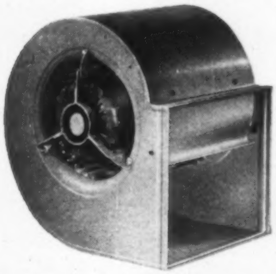
FOR THE FINEST
IN BLOWERS,
BLOWER PARTS,
EXHAUST FANS,
AND COMPONENTS
FOR EVERY
AIR-HANDLING
REQUIREMENT

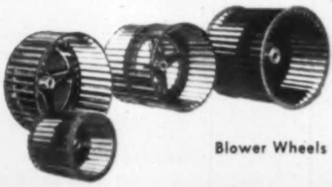

Belt Drive Blowers


Bearings


Pillow Blocks


Econo-Pak Blowers


Direct Drive Blowers

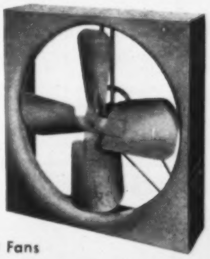

Blower Wheels

Put your Problems up to Lau

If you are an OEM* in the fields of air conditioning, heating, ventilating, refrigeration, oil burning, or automotive equipment . . . consult **Lau** for engineering know-how, advanced design, and manufacturing experience. Write for **Lau** Blower Catalog 707.

*Original Equipment Manufacturer

Pulleys


Exhaust Fans

LB-6-55

THE LAU BLOWER COMPANY • 2112 Home Avenue, Dayton 7, Ohio

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INDOOR COMFORT

LAU World's Largest Manufacturer of Air Conditioning Blowers

Yula

A Mark
of Reliability
in the
Industry

...for all types of
HEAT EXCHANGERS

FREON COOLERS
CONVERTERS
INSTANTANEOUS HEATERS
CONDENSATE COOLERS

•

BAYONET FUEL OIL HEATERS
STRAIGHT TUBE FUEL OIL HEATERS
SUCTION FUEL OIL HEATERS
CONVENTIONAL BELOW WATER-LINE F.O. HEATERS
NEW YORK CITY APPROVED BELOW WATER-LINE F.O. HEATERS

•

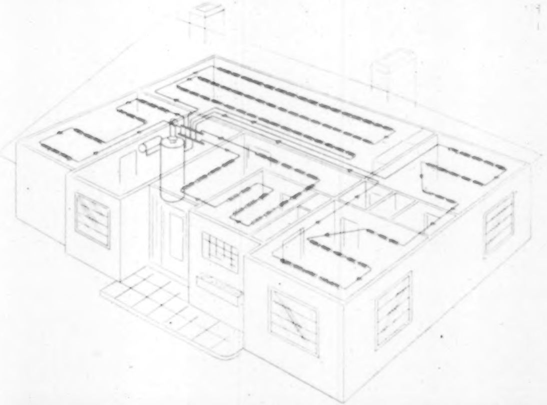
YULA CONDENSATE SIGHT TANK WITH PROBE
THERMOSTATIC MIXING VALVES
RELAY BOX USED WITH N.Y. CITY APPROVED BELOW WATER-LINE F.O. HEATER, AND WITH CONDENSATE SIGHT & PROBE

YULA WATER HEATERS, INC. 166 WEST 225th STREET, NEW YORK 63, N.Y.

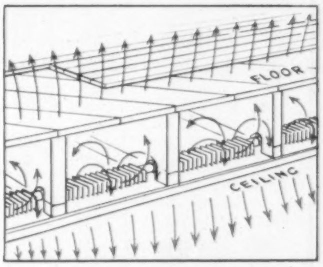
"We chose KRITZER Radiant Panel Heating for its *clean, quiet, economical comfort*"

So says Bill Readey, Executive Secretary of the Plumbing Contractors' Association of Chicago, of his new home on Chicago's Northwest Side. It is the cleanest type of heating with no dust, no blasts of air, or hot spots anywhere in the home. It is economical to install because one section of Kritzer Coils takes the place of many lengths of ordinary tubing. Because the coils are not imbedded in any building materials, the heating contractor can install it alone without *special* cooperation from other labor divisions.

The perspective drawing illustrates a typical layout of Radiant Coils in the average home. For complete information on Radiant Panel Heating write for Engineering Bulletin No. 50 RE. Address: Kritzer Radiant Coils, Inc., 2901 Lawrence Avenue, Chicago 25.

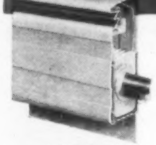


THIS IS HOW IT WORKS . . .

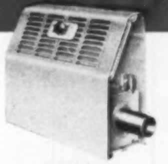


Runs of coil sections are placed at right angles to the ceiling joists. The coils in these spaces heat the air which in turn heats the ceiling or floor surfaces. The ceiling and/or floor then radiates warmth into the rooms evenly and thoroughly. Coil sections may also be employed between wall studs to make a complete radiant panel of the wall surface.

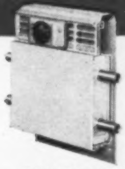
OTHER KRITZER QUALITY HEATING PRODUCTS



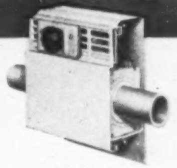
"K" LINE BASEBOARD



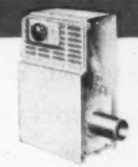
SLOPE TOP BASEBOARD



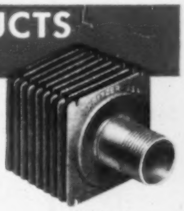
STANDARD BASEBOARD



UNIVERSAL BASEBOARD



CONVECTOR, SLOTTED FRONT



KRITZER FINNED TUBE

KRITZER

SEE YOUR JOBBER FOR KRITZER PRODUCTS

IF IT'S KRITZER, IT'S RIGHT, SIR!

Whatever you do...
don't miss the

American Blower

exhibit

at the

INTERNATIONAL EXPOSITION!

Booths 22 & 24

See

all new American Blower products for heating, ventilating, air conditioning!

Visit

the American Blower Exhibit at the International Heating and Ventilating Exposition at Commercial Museum, Philadelphia, January 24th through the 28th, 1955!

AMERICAN BLOWER CORPORATION, DETROIT 32, MICHIGAN
CANADIAN SIROCCO COMPANY, LTD., WINDSOR, ONTARIO
Division of American Radiator & Standard Sanitary Corporation

Serving home and industry:
AMERICAN-STANDARD • AMERICAN BLOWER • CHURCH SEATS & WALL TILE • DETROIT CONTROLS • KEWANEE BOILERS • ROSS EXCHANGERS • SUNBEAM AIR CONDITIONERS

Hot Water
by
Sellers*

*FIVE TYPES OF HEATERS . . .

--each designed for a particular service

Together they cover the entire field of large volume water heating—hard water, soft water, naturally corrosive, and zeolite softened water. Each heats water for ordinary service and for high temperature sterilizing—always clean and rust free.

No single type of heater can do all of these jobs well—the selection of the correct type from the full Sellers' line and Sellers' experience are required.

SEND FOR YOUR FREE COPY!

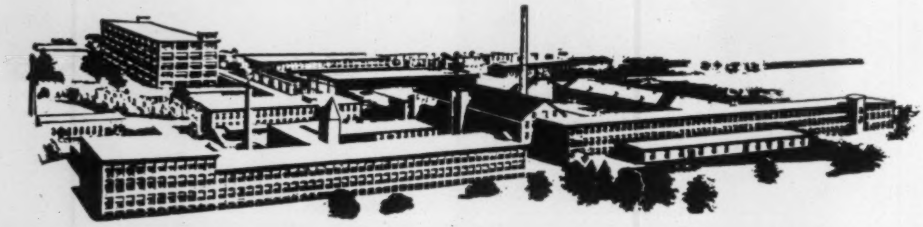
Before you buy **any water heater** —send your letterhead for this informative story on water and **how to heat it. It's free**—no salesman will call.

THE FACTS
ABOUT
HOT WATER

Sellers ENGINEERING CO.

535-6 N. CLARK STREET CHICAGO, ILL.

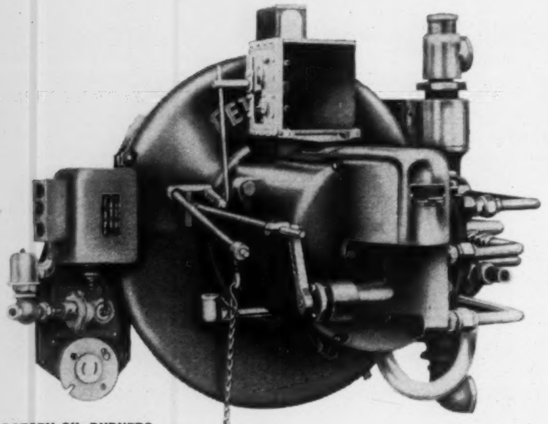
Blast Heaters • Immersion Automatic Water Heaters • Combustion Units • Industrial Gas Burners • Vertical Steam Boilers • Immersion Tank Heaters •



DAVIS & FURBER MACHINE COMPANY, NORTH ANDOVER, MASS.

SAVED $12,000

on fuel the first year with



ROTARY OIL BURNERS
Horizontal rotary oil burners make possible substantial fuel savings by burning the low-cost heavy fuel oils with complete dependability. Models for every industrial need. Capacities up to 600 boiler horsepower.

COMPLETE PACKAGED UNIT
A complete forced draft combustion system with all parts factory-assembled and tested. Saves installation time and cost, gives top performance and fuel economy.

PETRO

T. M. REG. U. S. PAT. OFF.

INDUSTRIAL OIL BURNERS

"The changeover to Petro oil firing paid for itself the first year," says Forbes Rockwell of Davis & Furber

PETRO oil burners do *two* jobs in this huge plant. They produce steam for heat and generate the electric power for plant operation. "We consider it nothing short of a minor miracle the way your dealer's engineering department came in here and changed us over to oil in the middle of winter without causing us to curtail the least bit in either power or heat," says Mr. Rockwell. Petro oil burners can save money for you too.

PETRO preheats oil for steady, sure firing

Cold oil is sluggish, starts slowly, and burns irregularly so the makers of Petro adopted the "thermal viscosity principle" of *preheating oil* to an efficient temperature before it is injected into the firebox. This makes possible fast starting, steady firing, and lower fuel costs.

PETRO burns lower cost fuel with complete reliability

The pre-heating of oil enables Petro owners to burn the heavy fuel oils (Nos. 5 and 6), which average 8% richer in heat value than light burner oils, and cost less per gallon. Petro burners are completely automatic, and accurately take care of fluctuating load requirements.

PETRO is adaptable to any boiler room

Petro industrial oil burners are designed and built to *modernize* the firing of your present boilers. The flame is adjustable to any firebox, and the installation is adaptable to any boiler room layout. This means that you save substantially on initial installation costs, and more money every day on fuel and labor costs. Mail coupon or write for free catalog and information.

Mail this coupon for Free Catalog

PETRO BURNERS

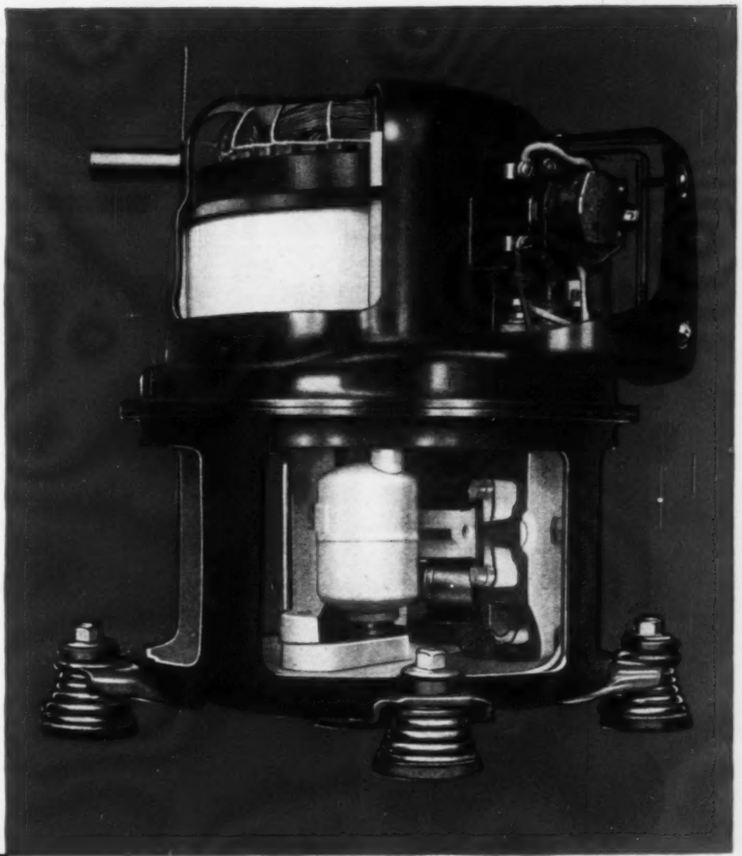
PETRO
3238 West 106th St., Cleveland 11, Ohio.
In Canada: 2231 Bloor St., West, Toronto, Ontario.

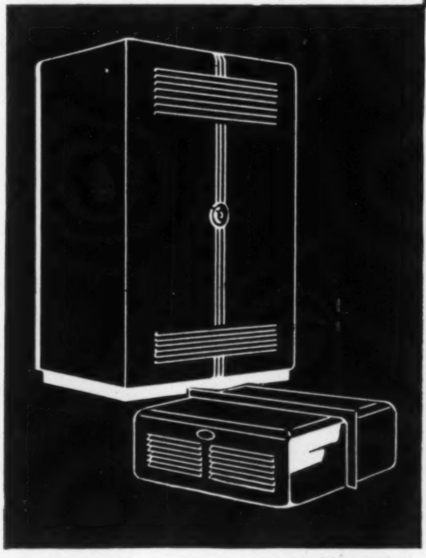
Please send the 20-page illustrated Petro catalog.

Name
Company
Address
City State

COPELAND
WELDED
HERMETICS

**bring
cool-running,
2-cylinder
smoothness
to
package
air conditioning**



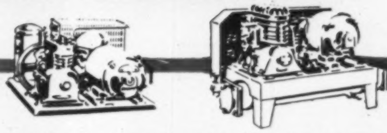


You're looking at a cutaway view of the welded motor-compressor that can give your refrigeration and air conditioning products the competitive edge you need.

This potent Copeland package is engineering at its best. Twin cylinders bring whisper-quiet smoothness. Heavy-duty, high power factor motor insures positive performance and long-range economy. Use of F-12 in these motor-compressors can result in as much as 75 F. lower temperatures in windings, crankcase, oil and discharge side. You'll appreciate their high capacities.

We could go on, point by point, and prove construction superiority. Better yet, we want you to test the Copeland welded motor-compressor in your own equipment under your own conditions.

Write, wire or phone for details about the "try it yourself" test.

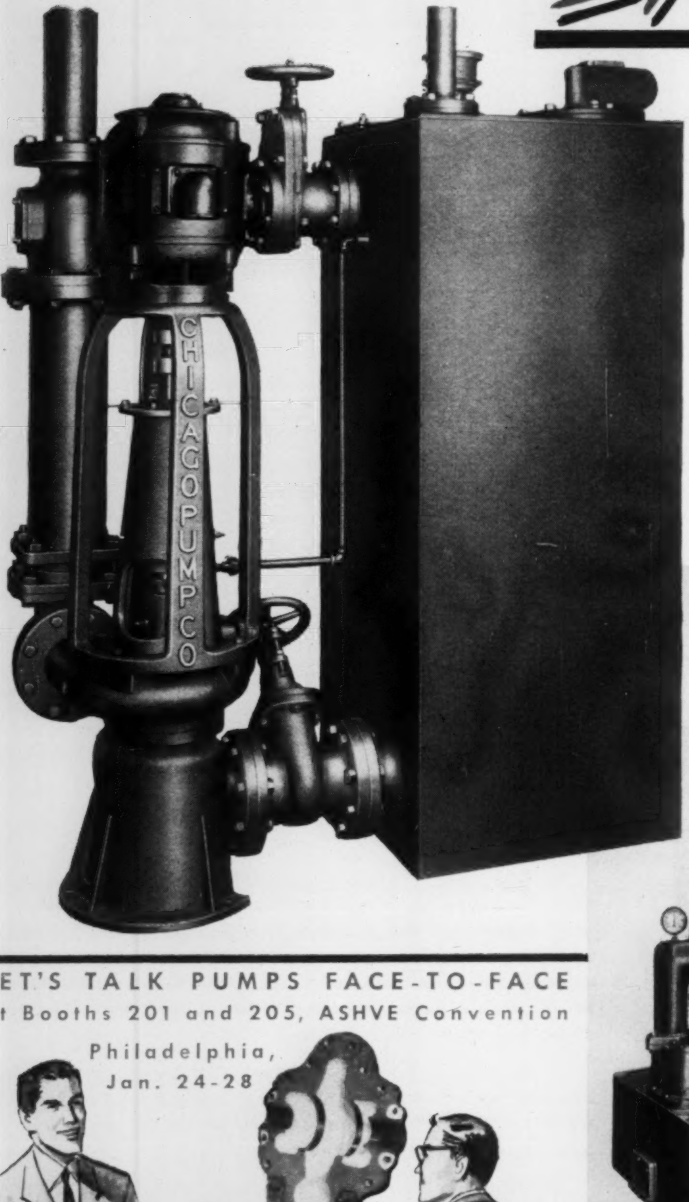


Copeland
DEPENDABLE *Electric* **REFRIGERATION**

REFRIGERATION UNITS (OPEN-TYPE AND COPELAMETIC) WATER COOLERS

COPELAND REFRIGERATION CORPORATION SIDNEY, OHIO

these "Extras"



Extra Positive Clog-Proof Sewage Handling

FLUSH-KLEEN Sewage Ejector-TYPE "S"

The Flush-Kleen Sewage Ejector can't clog because only liquid is handled by the impeller. Coarse matter is strained out, then backwashed from the strainer into discharge pipes. No strainer baskets to clean, no repairs due to clogging, no foul basins because solids never reach the wet basin. Besides being easier to maintain, Flush-Kleens last longer and require less power. Write for details in Bulletin 122C.

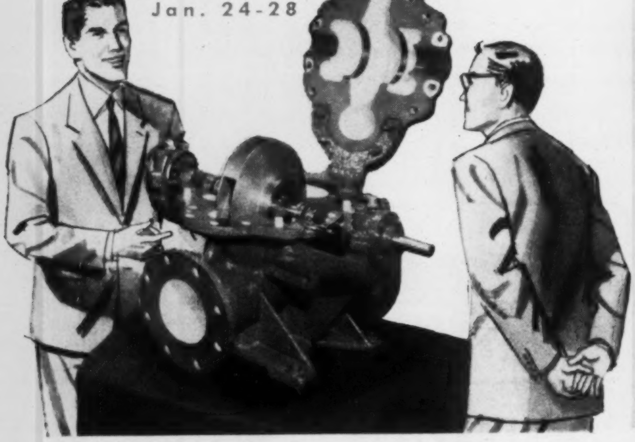
Extra
Full Capacity Even at High Temperatures

CONDO-VAC
CHICAGO PUMP CO

DUPLEX CONDO-VAC RETURN LINE VACUUM AND BOILER FEED PUMP

low inlet—no close clearances—no expensive maintenance — no vacuum on stuffing box results in full air handling capacity applied to system—for vacuum heating systems, pressures to 40 psi., capacities 2,500 to 150,000. See Bulletin 270.

LET'S TALK PUMPS FACE-TO-FACE
At Booths 201 and 205, ASHVE Convention
Philadelphia,
Jan. 24-28



in CHICAGO PUMPS

— mean longer, better performance — lower cost operation and installation

For over 45 years Chicago Pump Company has specialized in manufacturing pumps specifically for service in plumbing, heating and air conditioning systems.

Architects, engineers and contractors assure building owners of reliable, long life service by using Chicago Pumps.

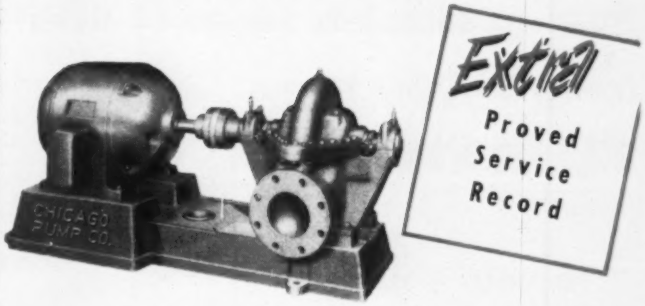
A COMPLETE LINE FOR EVERY BUILDING SERVICE

The Chicago line includes centrifugal pumps for hot and chilled water circulating, condensation and vacuum heating, air conditioning, pneumatic water systems, booster systems, cooling towers, drainage and sewage disposal. For details, write for Bulletin 25.

Extra
Won't Steam Bind
CHICAGO PUMP CO.

SURE-RETURN CONDENSATION PUMP AND RECEIVER

low inlet—positive head on suction—no friction in manifold between pump and receiver—handles extremely hot condensate without steam binding—for systems to 75,000 EDR and low or medium pressures. See Bulletin 250.



DOUBLE SUCTION HORIZONTALLY SPLIT CASE PUMP

accurately machined and fitted revolving parts in carefully cast casing. Have proved reliable for house pump, circulating and booster service. See Bulletin 101.

Extra
Low Installation Cost
CHICAGO PUMP CO.

TYPE AVC CONDENSATION PUMP AND RECEIVER

low inlet—no elaborate foundation needed for installation—for systems to 10,000 EDR and 10-30 psi. See Bulletin 245.

Extra
Leak-proof Seal

NEW F-C AND C-C PUMPS EITHER FLEXIBLE-COUPLED OR CLOSE-COUPLED

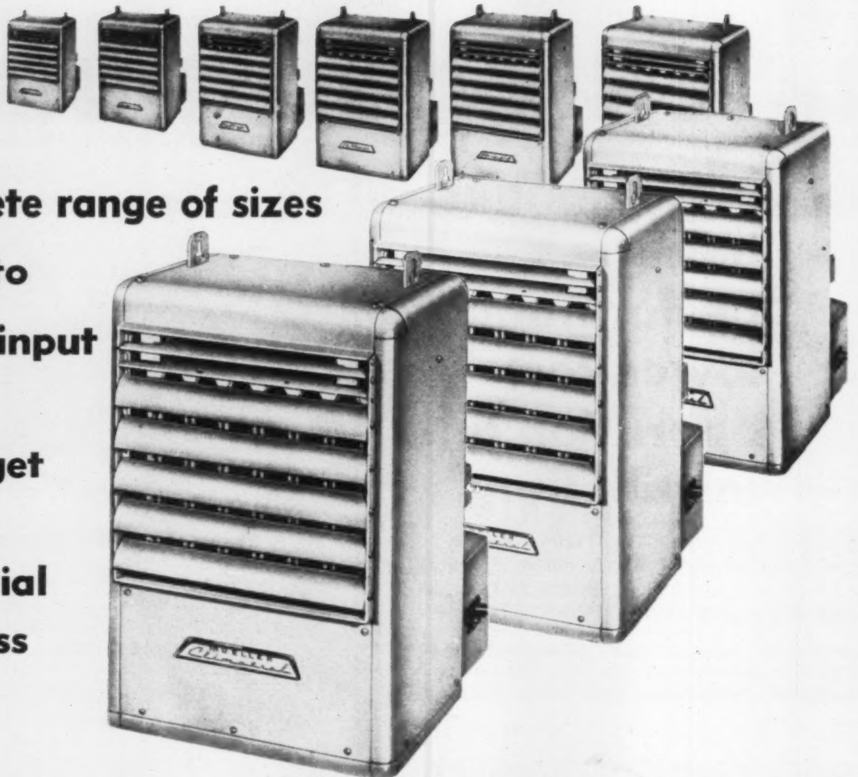
compact, smooth running, quiet—ceramic faced seal is highly resistant to wear—for circulating and booster service. Heads from 10 to 190 feet, capacities from 5 to 400 gpm. Bulletins 107 and 108.

▶ Write to Department A

CHICAGO PUMP COMPANY
Subsidiary of Food Machinery and Chemical Corporation
BUILDING PUMP DEPARTMENT
622 DIVERSEY PARKWAY • CHICAGO 14, ILLINOIS

Condo-Vac, Sure Return, AVC, LVC,
Fire, House & Circulating Pumps
Pneumatic & Tankless Water Systems.

Flush-Kleen Sewage Ejectors
Little Giant & Non-Clog Bilge Pumps
Pumps for every industrial use.



Now—a complete range of sizes from 25,000 to 225,000 BTU input

...to help you get a bigger share of the commercial heating business

Mueller Climatrol

Type 160 Gas, Direct-fired Unit Heaters

Here's the perfect answer to your space heating problems — Mueller Climatrol Type 160 gas, *direct-fired,* suspended unit heaters. They're compact, attractive, efficient — easy to install and service.

The Type 160 is A.G.A. approved for use with natural, mixed, manufactured, and propane gas. Check these "advance design" features built in this unit.

Compact — only 29½″ x 19½″ x 12″ (for the 50,000 Btu size.)

Easy to Install — shipped pre-wired and pre-assembled. Easy to hang.

High Crown Sheet — no "hot spots," no joints or welds exposed to flame.

Welded-Steel, Air-Tube-Type Heat Exchanger — for maximum heat extraction, efficiency, *longer life.*

Quiet Fan — propeller type, properly pitched for even air distribution.

Cast-Iron, Drilled-Port Burner provides even heat distribution over entire hearth area.

Built-In Diverter with rear flue outlet.

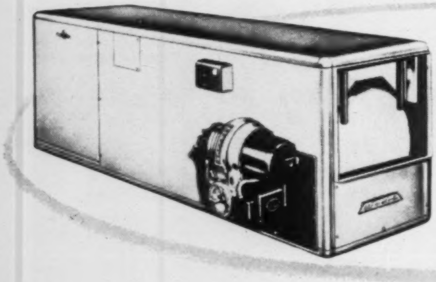
Adjustable louvers let you direct the air where you want it.

Smooth Finish in Mountain Spring Green color, easy to repaint to match room decor.

Write for facts and figures that tell you more about this Mueller Climatrol unit heater line.

Mueller Climatrol

DEPT. 115. 2023 W. OKLAHOMA AVE. • MILWAUKEE 15, WIS.



Also the Type 253 Oil-fired Unit Heater

This modern oil-fired unit is available in four sizes — 110,000, 150,000, 200,000 and 250,000 Btu input. It can be suspended as a unit heater or it can be used as a horizontal furnace in homes for perimeter, radiant warm-air and conventional, forced, warm-air heating. Equipped with a large, quiet blower, the Type 253 is shipped assembled and pre-wired.

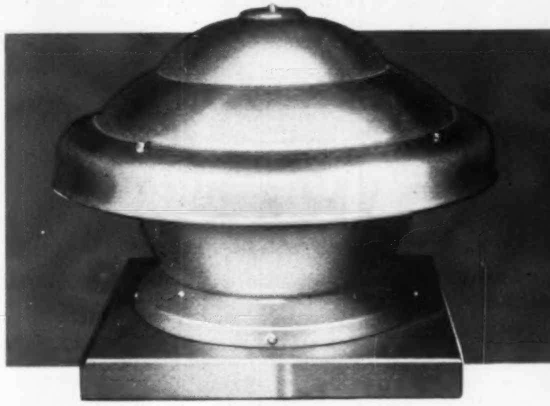
98th Anniversary
MUELLER • MILWAUKEE

D-179

Here's what's new at CARNES

. . . TWO NEWLY DESIGNED PRODUCTS

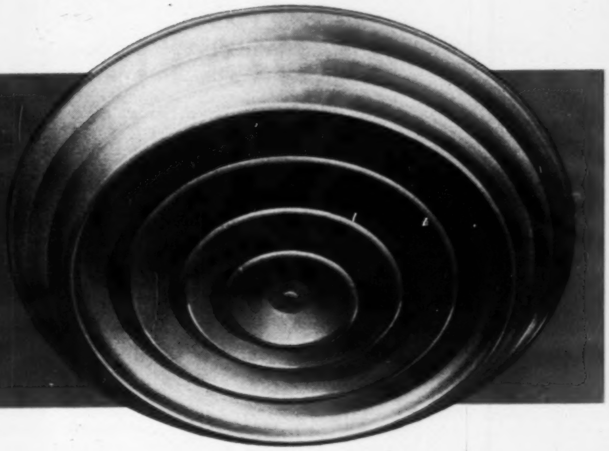
1 NEW MODEL CL *Centrifugal* ROOF VENTILATOR



Carnes' newest power roof ventilator is designed to provide a low contour for today's low parapet buildings . . . . and to provide all these fine features: Wide range of capacities; all-aluminum construction; quiet operation; heavy-duty ball bearing protected motors; precision balanced fan wheels and efficient trouble-free service.

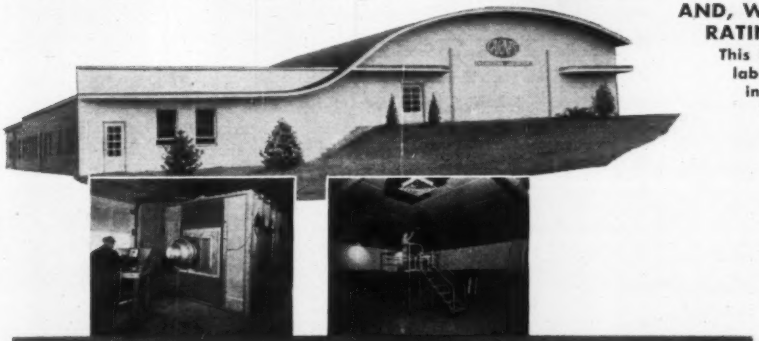
CAPACITIES. . . .300 to 6,000 C.F.M.
WHEEL SIZE. . . 5" through 24"

2 NEW MODEL EJ DIFFUSER



Another newly designed model from Carnes. Deep ceiling plate eliminates all ceiling smudging and makes use of anti-smudge cones unnecessary. A full range of sizes is available — all fully adjustable for air pattern.

. . . and here's why CARNES makes them better!



AND, WHY YOU CAN DEPEND ON CARNES RATING AND PERFORMANCE DATA

This is Carnes modern engineering and research laboratory. Here, a specially designed building of 12,000 square feet houses complete facilities for expert engineering. And thorough testing under actual operating conditions assure that every product bearing the Carnes name is the finest quality throughout.

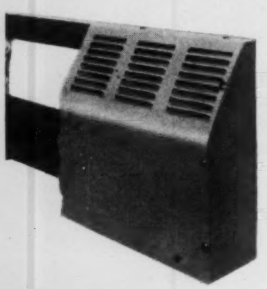
CARNES CORP.
VERONA, WISCONSIN

Visit Us!
at Booth 521
12th International Heating and Ventilating Exposition
Convention Hall, Philadelphia
January 24-28

STEDCO
HI·therm
RADIATION

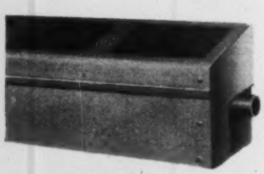
a complete line of radiation in 23 capacities

7 Enclosures in 30 VARIATIONS---



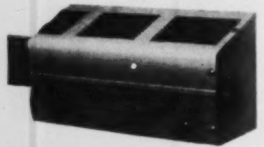
THERMO-LUX

Meets every requirement for high efficiency and attractive appearance.



SLIP-ON

Attractive, compact enclosure designed for easy installation.

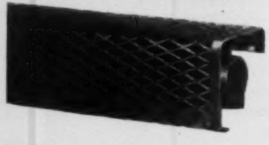


TUF-TOP

Extra heavy duty enclosure designed to resist abuse.

FLAT-TOP

Compact and attractive enclosure that's easy to install.



MESH GUARD

Low cost protective cover for all HI-THERM FIN PIPE RADIATION.

BASEBOARD

A choice of enclosures for flush or recessed installation.

HI-THERM RADIATION AND ENCLOSURES FOR COMMERCIAL, INDUSTRIAL AND RESIDENTIAL INSTALLATIONS.

STEDCO HI-THERM
"The complete line" now offers you a full choice of fin tube radiation and enclosures for every heating requirement.

HI-THERM RADIATION
A complete range of pipe sizes, fin sizes, tube and fin materials to offer a size and capacity radiation that's just right for every hot water or steam heating system.

HI-THERM ENCLOSURES
To meet every need and choice of style. HI-THERM ENCLOSURES are available in single, double or triple tier variations to accommodate the many sizes and capacities of STEDCO HI-THERM RADIATION.

FOR EVERY HEATING INSTALLATION
You will find STEDCO HI-THERM offers the correct capacity of radiation and a choice of enclosures to meet your every specification.

GET THE FULL STORY on this complete line of fin pipe radiation and enclosures by sending today for the new 16 page HI-THERM CATALOG.

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RADIATION
Industrial · Commercial · Residential
STEDCO PRODUCTS WILKES-BARRE, PENNA.

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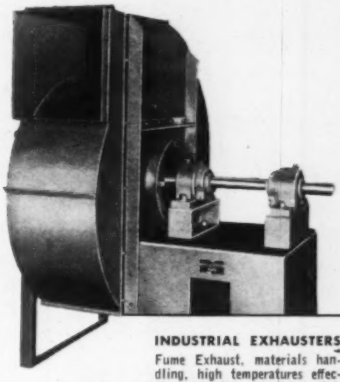
71 Lehigh Street, Wilkes-Barre, Pa.

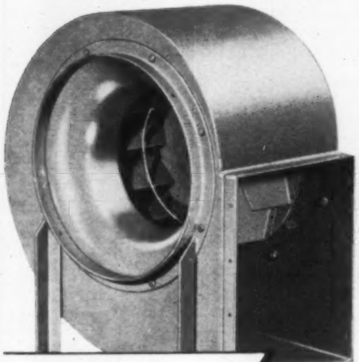
Bayley

Engineered

AIR HANDLING EQUIPMENT

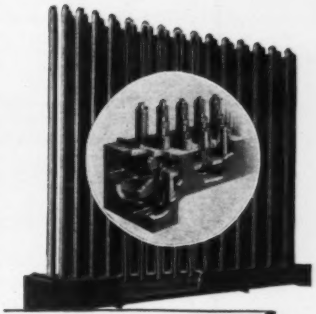


INDUSTRIAL EXHAUSTERS
Fume Exhaust, materials handling, high temperatures effectively handled with this radial-blade fan.

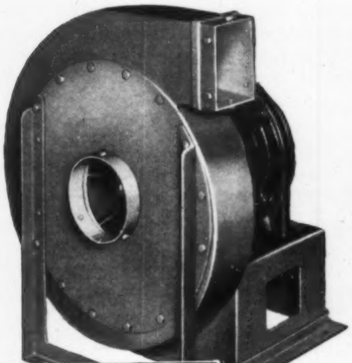


VENTILATING FANS
Equipped with forward or backward curved wheels — for Ventilating Conditioning, Mechanical Draft.

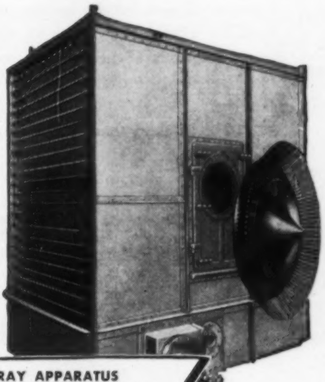
VENT SETS
Belt or Direct-Driven, designed for applications requiring moderate air volume.



HEATERS
Blast Coils — Aerofin & Chinook; Heating and Cooling; Steam, Water, Direct Expansion.



PRESSURE BLOWERS
For draft and conveying with moderate air volumes at relatively high pressures.



SPRAY APPARATUS
Turbo, Pressure Nozzle and Cellular Air Washers for comfort or process conditioning applications.

Used individually, or in combination, the units of BAYLEY equipment illustrated here provide efficient, economical solutions for your air handling problems. Each item is designed and engineered by Bayley specialists for maximum service and efficiency.

Check and mail the Coupon for illustrated literature of special interest to you.

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FIRM ....

ADDRESS ....

Here's THE MODERN, PRACTICAL WAY TO HEAT ANY JOB . . .

*Airfoil**

Finned Radiation

AIRFOIL* Steel Pipe and fins is available in four sizes, 1¼" ips 3¼ x 3¼ fins; 1¼ ips, 4¼ x 4¼ fins; 2" ips, 4¼ x 4¼ fins; spacings to meet the heating load requirements. The expansion cradle with special adjustment provides proper pitch, and prevents pulling of brackets from wall. Sliding cradle permits ¾" expansion or contraction.

CUSTOM-FIT* enclosures . . . pre-cut and pre-punched are quickly and easily installed. Expanded metal grilles are available, too, with AIRFOIL*

RADIANT-RAY* enables you to tailor an installation to your clients' particular needs with factory parts alone. No need to hold up, or get figures, for special items . . . just check the RADIANT-RAY* parts lists, and your need is filled!

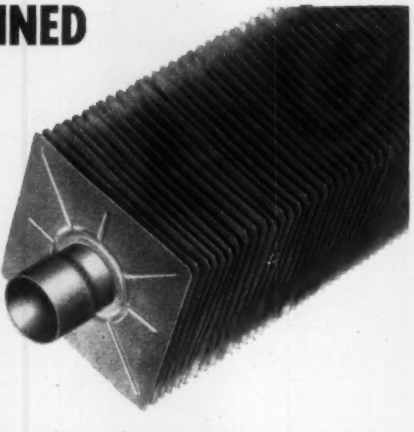
It will pay you well to investigate RADIANT-RAY* more thoroughly. We'll be glad to send literature . . . and follow up with an engineer, if you desire. Just drop us a line today.

*Trademark

radiant•ray

BRAND

ALUMINUM FINNED COPPER TUBE...



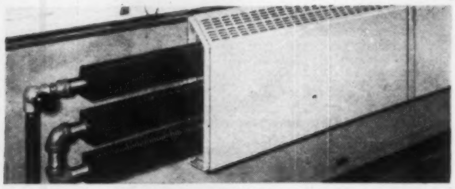
RADIANT — RAY* wall radiation making use of copper finned with aluminum provides the excellent transmission capacities of the most efficient metals for heat transfer. Higher capacity is obtained per running foot of radiation in steam or hot water systems.

Copper tubes make installation quicker and easier because the fittings are easily sweated right on the job. As shown here . . . one end is flared for quick joining. Units are shipped with the ends well protected and ready for soldering.
RADIANT — RAY* copper-finned aluminum radiation is designed for use with CUSTOM-FIT* or RAYVECTOR* sloping top or flat top enclosures.
Elements with 1" nominal copper tube with 3¼" x 3¼" embossed aluminum fins and 1-¼" nominal with 4-¼" x 4-¼" fins are available in 1-½' to 8' lengths.
We'll be glad to send literature.

★ ★ ★ RADIANT-RAY RADIATION, INC.

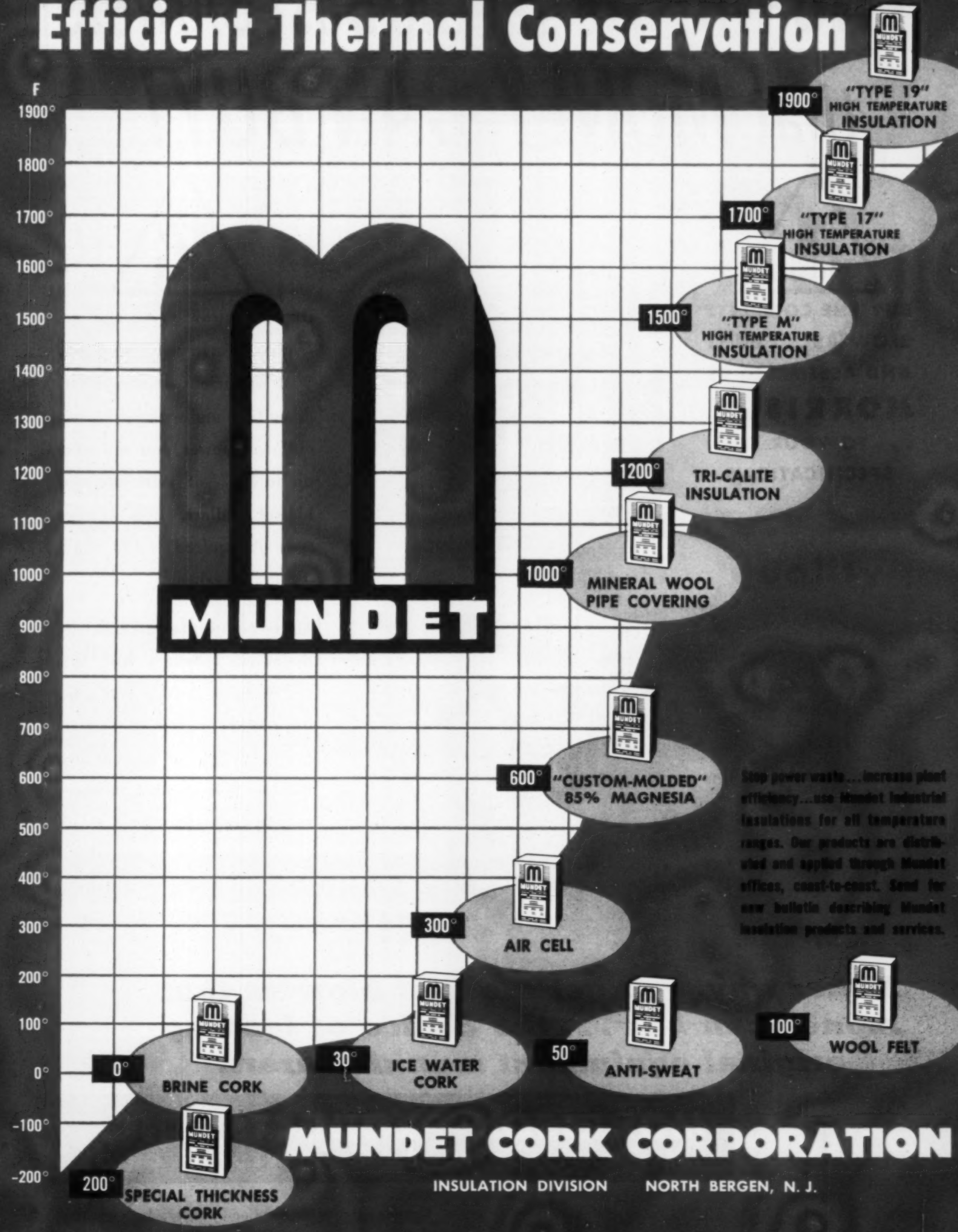
P. O. BOX 64 NEWINGTON, CONN.

MANUFACTURED BY THE MAKERS OF THE FAMOUS → radiant•ray BRAND BASEBOARD HEATING



. . . and don't forget that we'll be waiting to see you at the INTERNATIONAL HEATING and VENTILATION EXPOSITION . . . . **BOOTH 310**

Complete Service for Efficient Thermal Conservation



F
1900°
1800°
1700°
1600°
1500°
1400°
1300°
1200°
1100°
1000°
900°
800°
700°
600°
500°
400°
300°
200°
100°
0°
-100°
-200°
MUNDET
1900° "TYPE 19" HIGH TEMPERATURE INSULATION
1700° "TYPE 17" HIGH TEMPERATURE INSULATION
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100° WOOL FELT
50° ANTI-SWEAT
30° ICE WATER CORK
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Stop power waste . . . increase plant efficiency . . . use Mundet Industrial Insulations for all temperature ranges. Our products are distributed and applied through Mundet offices, coast-to-coast. Send for new bulletin describing Mundet insulation products and services.

MUNDET CORK CORPORATION

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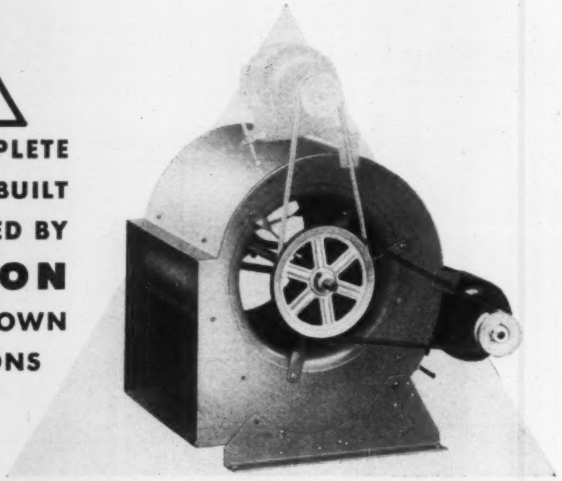
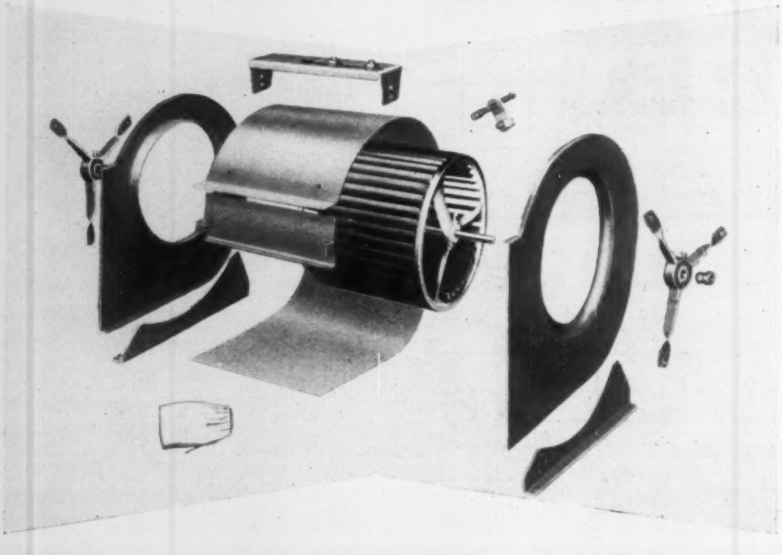
TWO WAYS to get the Best Blowers that MONEY CAN BUY!

1

BUY THE COMPLETE BLOWERS . . . BUILT AND ASSEMBLED BY MORRISON . . . TO YOUR OWN SPECIFICATIONS





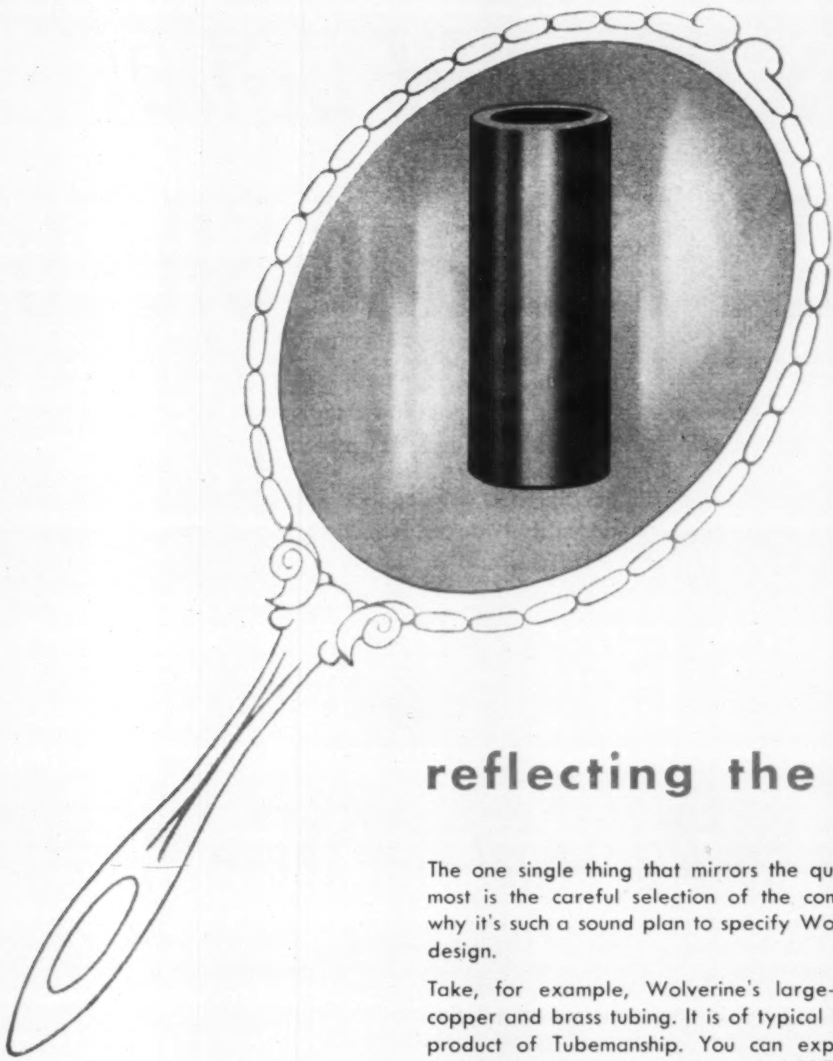
2

Buy Morrison parts and assemble them in your own plant. With sufficient man-hours of down time and with your present man power you can save up to 50% of your invested blower dollars. Less storage space is required — and no additional overhead.

Many companies assembling their own blowers find this system more flexible and more adjustable to their overall manufacturing operation. Quality is controlled in every step of the assembly.

Either way, you get the best blowers that money can buy . . . the choice of leading original equipment manufacturers.

MORRISON PRODUCTS, INC.
16816 WATERLOO ROAD • CLEVELAND, OHIO



reflecting the **quality**

The one single thing that mirrors the quality of your product most is the careful selection of the components used. That's why it's such a sound plan to specify Wolverine tubing in your design.

Take, for example, Wolverine's large-diameter commercial copper and brass tubing. It is of typical Wolverine quality—a product of Tubemanship. You can expect fast delivery on straight lengths in diameters up to 4½″ O.D. and coils up to 1⅜″ O.D.

You'll find the up-to-the-minute story in Wolverine's commercial tube book. Write for it today. WOLVERINE TUBE, 1461 Central Avenue, Detroit 9, Michigan.

EST 1916

WOLVERINE TUBE
DIVISION OF CALUMET & HECLA, INC.
Manufacturers of Quality Controlled Tubing
and Extruded Aluminum Shapes

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EXPORT DEPT., 11 E. 40TH ST., NEW YORK 16, N. Y.

There's no "...or equal" for EASY-FLO and SIL-FOS

EASY-FLO and SIL-FOS are the original low-temperature silver brazing alloys conceived and perfected by Handy & Harman metallurgists.

Years of research went into the development of the alloys and the manufacturing methods and quality controls used in their production. In composition, in physical properties and in unvarying uniformity, EASY-FLO and SIL-FOS alloys stand alone.

It is from these exclusive features that EASY-FLO and SIL-FOS alloys get their remarkably fast brazing action and ability to make high-strength, liquid and gas-tight joints, consistently and at surprisingly low cost. That's why there's no *"or equal"* for EASY-FLO and SIL-FOS alloys when it comes to fast, reliable, economical metal joining.

and there's no "...or equal" for these SERVICES

The following technical and practical assistance is available, without cost or obligation, to all users of EASY-FLO and SIL-FOS alloys through Handy & Harman's engineering and research departments, field service staff and nearest distributor.

DEMONSTRATIONS of EASY-FLO and SIL-FOS silver brazing in your own shop.

SURVEYS of your metal joining to determine if and where EASY-FLO or SIL-FOS brazing can benefit you.

DESIGN AID for your engineers to assure best joint design for EASY-FLO or SIL-FOS brazing.

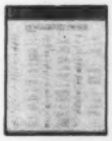
SAMPLE BRAZING of your parts by our technicians to determine the best way to silver braze them.

PRODUCTION AID to help work out the procedure that will give you the output you want at lowest cost.

OPERATOR TRAINING of your key men in our brazing schools, or by a program we set up in your plant.

RESEARCH in our laboratories to work out your special silver alloy brazing problems.

SEND FOR THIS LIST AND BULLETIN



You can get the real EASY-FLO and SIL-FOS alloys, and their companion low-temperature HANDY FLUX, only from Handy & Harman Authorized Distributors. They're located in principal centers throughout the country. Write for the "Distributor List" and contact the nearest one.

EASY-FLO
SIL-FOS

BULLETIN 20 contains the full facts about EASY-FLO and SIL-FOS. It makes clear why these alloys are being used today, in tremendous quantities throughout all industry. It also includes useful information about joint design and fast brazing production methods. Write for a copy.

HANDY & HARMAN
FOUNDED 1867
QUALITY SERVICE
ORIGINATORS OF EASY-FLO & SIL-FOS

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General Offices: 82 Fulton St., New York 38, N. Y.
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BRIDGEPORT COPPER WATER TUBE FOR VENTS AND DRAINS

offers more plus benefits

+ Lower Installed Cost . . .
Bridgeport Copper Water Tube can be installed in a fraction of the time needed for other materials—copper tube can be pre-cut and pre-assembled.

+ Longer Life—Lower Maintenance . . .
Drainage lines of Copper Tube never rust—often outlast the life of buildings—give lasting owner satisfaction on new construction or replacement use.

+ More Economical Layout and Design . . .
Bridgeport Copper Water Tube requires less space than other materials—can be laid out more efficiently—offers savings in multiple installations.

Bridgeport Copper Water Tube in large diameters for soil, waste and vent lines is available from leading wholesalers everywhere. They also carry smaller sizes of Bridgeport Copper Tube for water-supply and heating lines—now available in Bridgeport's new individual coil cartons.

BRIDGEPORT BRASS
COMPANY ◆ BRIDGEPORT, CONNECTICUT
Sales Offices in Principal Cities—Conveniently Located Warehouses
Mills at Bridgeport, Conn., Indianapolis, Ind., Adrian, Mich.
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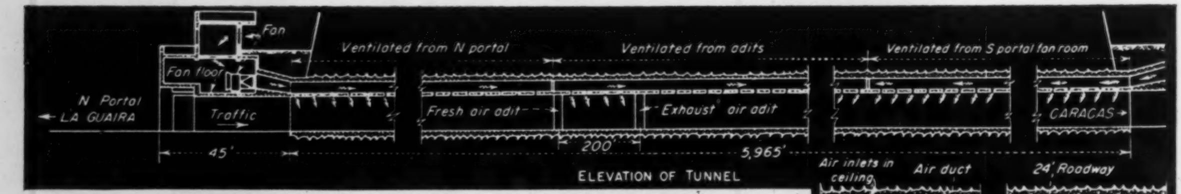
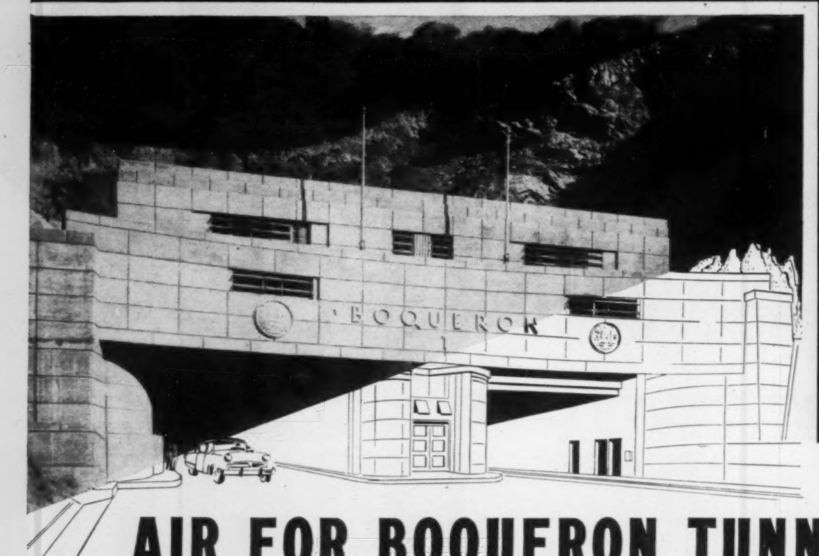

Fan
Ventilated from N portal
Ventilated from adits
Ventilated from S portal fan room
Fan floor
N Portal
LA GUAIRA
Traffic
Fresh air adit
Exhaust air adit
CARACAS
45'
200'
5,965'
ELEVATION OF TUNNEL



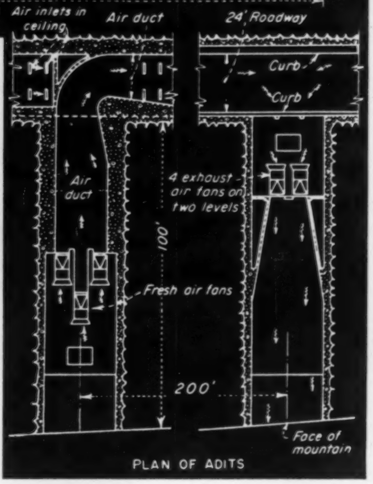
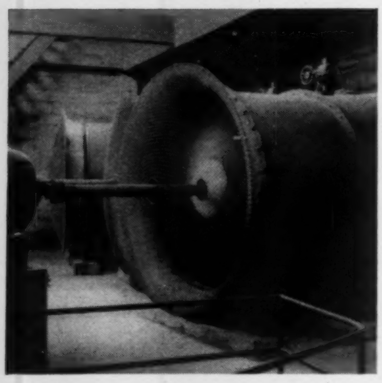

Air inlets in ceiling
Air duct
24' Roadway
Curb
Curb
Air duct
4 exhaust air fans on two levels
100'
Fresh air fans
200'
Face of mountain
PLAN OF ADITS

Diagram of Ventilating System Boqueron Tunnels

AIR FOR BOQUERON TUNNELS

...125 TONS A MINUTE



84" Joy Fan at Boqueron South Portal. Total available horsepower on job is 2115. Individual fan capacities range from 88,000 to 208,000 cfm at static pressures from .75" to 4.0".

VENEZUELA'S BOQUERON TUNNELS, on the Caracas-La Guaria expressway, use a vent system of 24 Joy Axivane fans . . . largest installation of its design in existence.

Shortest of the two twin-bore tubes (1634') is serviced by five 72" blowing fans above the North portal.

Venting the 6055' tunnel is more complex. Nine 72" and ten 84" fans are mounted above the portals and in two adits at quarter points (see diagram). Exhaust air is handled by four of the 84" units in one of the adits. Fan speed is automatically regulated by traffic conditions.

The Joy-designed drive arrangement eliminates power loss and maintenance. The 72" fans are powered by direct-connected, two-speed motors. The 84" units utilize wound-rotor and squirrel-cage motors mounted in tandem.

Joy Axivane Fans were selected because of their well-known high-capacity/low-power-consumption characteristics. Other contributing factors were the inherent structural strength and compactness of the vaneaxial design.

For complete information on Joy Series 1000 Axivane Fans, write for Bulletin J-611 to **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: *Joy Manufacturing Company (Canada) Limited, Galt, Ontario.*

Consult a Joy Engineer

FOR AIR COMPRESSORS • ROCK DRILLS • WAGON DRILLS • CORE DRILLS • BLAST HOLE DRILLS PORTABLE HOISTS • FANS • BLOWERS TUNNEL, QUARRY, MINE EQUIPMENT

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JOY

SPECIALISTS IN THE COMPRESSION AND MOVEMENT OF AIR AND GASES SINCE 1885

Sure, that old pump still works,

but how much does it cost to keep?

That rugged old pump of yours may not be the bargain that it seems. Let's do some arithmetic. If the efficiency of the old pump is 75% vs. the 85% efficiency of the new pump, you are paying more to keep it than you would to replace it. That's because a new unit of equivalent output uses less power. Thus it soon saves its own cost — then begins to pay dividends.

Let's take a specific example—a small general service pump

Old pump efficiency 70%	**28.9 BHP**
New pump efficiency 79%	**25.6 BHP**
	3.3 BHP Saving

On the basis of 1¢ per KWH, the 3.3 BHP saving for a 6000-hour year (approximately 16 hours per day) amounts to $150. This saving, capitalized in 4 years at 4% adds up to $630. Yet the price of the new pump that saves $630 is only $438.

What would the pump replacement profit be in your particular case? Your De Laval representative can tell you exactly — in dollars and cents — as soon as he has the basic facts on your present installation. Call him in today or write to De Laval for Pump Fax Bulletin which includes a valuable "power-savings" chart.

DE LAVAL *Pumps*

DE LAVAL STEAM TURBINE COMPANY
871 Nottingham Way, Trenton 2, New Jersey

DL237A

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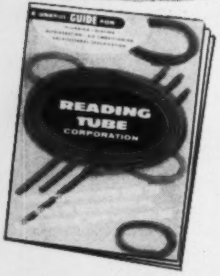
READING COPPER TUBE

One of the best ways to judge a product is by the calibre of the distributors who sell it.



NEW CATALOG

Reading's New 32 page guide for Copper Water Tube, Copper Refrigeration Tube, and Red Brass and Copper Pipe is now available. Write for your free copy today.

We, at Reading, consider it highly significant that America's leading distributors have chosen Reading Copper Tube to sell and recommend. These distributors build their business by handling the finest products — products whose quality and performance they can depend on to uphold their reputation for giving customer satisfaction. Of equal importance to them is service. And they know from experience that Reading's streamlined, shirt sleeve service eliminates delays . . . speeds delivery from factory . . . to distributor . . . to contractor. Next time you need copper tube . . . specify Reading . . . precision product of one of America's largest, completely integrated mills, specializing in the processing of copper tube from basic metal to finished tubing . . . and sold by America's best distributors.

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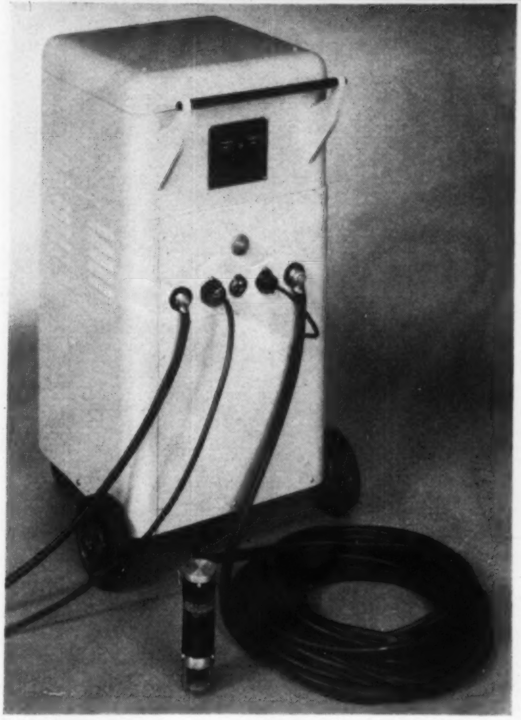
New

MODEL 6000-D

GRAHAM INSUL-PIN WELDER



IT WILL BE FEATURED
AT THE
INTERNATIONAL HEATING
& VENTILATING EXPOSITION
Philadelphia . . . Jan. 24-28
(Booth S-98)

•

See the Demonstration of the

Fastest Method Ever Devised for Attaching Insulation Pins

TO
GALVANIZED DUCT WORK

REDUCES
LABOR COST
AND
MATERIAL COST

GRAHAM MANUFACTURING CORPORATION
GRAHAM®
INSUL-PIN
System
DETROIT 20, MICHIGAN U.S.A.

Attaches Three Times As Many Per Hour

Here's a sure-fire way of reducing the cost of welding insulation pins to galvanized duct work **without distorting, burning or discoloring reverse side.** Use a Graham Insul-Pin Welder and you can attach three times as many per hour as by other methods. For example, in a recent test the Graham Welder enabled a workman to weld over 400 Insul-Pin Welding Pins in an hour's time, as compared with 135 fasteners by a method formerly followed.

When you're at the Show, make it a point to see a demonstration of the latest model (illustrated above) which embodies design change that make it even more efficient, convenient, practical and dependable than the time-proven models of the past.

WRITE FOR LITERATURE

Insul-Pin Clip Installer —magnetized to hold clip

GRAHAM MANUFACTURING CORPORATION
1541 E. 8-MILE ROAD
FERNDALE 20, MICH.

MAN OVER 45
MAN OVER 45
MAN OVER 45
MAN OVER 45
MAN OVER 45
MAN OVER 45
MAN OVER 45
MAN OVER 45
MAN OVER 45
MAN OVER 45
MAN OVER 45

But why MEN over 45?

Our doctors still don't know *why*, but if you are a man over 45 you are six times as likely to develop lung cancer as a man of your age twenty years ago. They *do* know, however, that their chances of saving your life could be about *ten times* greater if they could only detect cancer long before you notice any symptom in yourself. (Only 1 in every 20 lung cancers is being cured today, largely because most cases progress too far before detected.) That's why we urge that you make a habit of having your chest X-rayed every six months, no matter how well you may *feel*. The alarming increase of lung cancer in men over 45 more than justifies such precautions. Far too many men die needlessly!

Our new film "The Warning Shadow" will tell you what every man should know about lung cancer. To see this film and to get life-saving facts about other forms of cancer, phone the American Cancer Society office nearest you or simply write to "Cancer"—in care of your local Post Office.

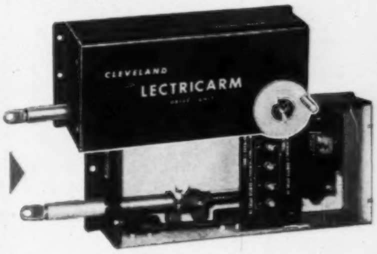
American Cancer Society

CLEVELAND CONTROLS cut boiler operating cost by *MILLIONS* every year!

Below are described the Cleveland combustion instruments and controls that save users millions of dollars every year through—less fuel consumption—lower cost operation—less maintenance, and greater efficiency. Controls are available to provide these savings on coal, gas or oil-fired boilers—natural or induced draft.

CLEVELAND
DAMPER CONTROL
CLOSE DAMPER
AUTOMATIC
OPEN DAMPER
1
2
3

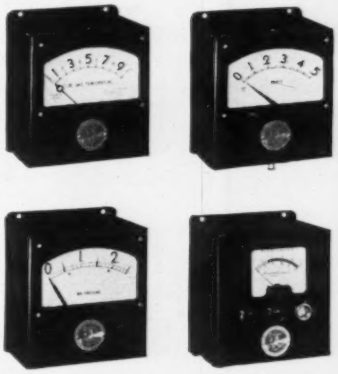
Automatic Damper Control—Maintains a constant rate of draft for greater efficiency from all fuels. Fully electric—sequencing or non-sequencing models available. Starting Draft Selector and "Lo-Draft" Cut-Off features for induced draft installation are optional.



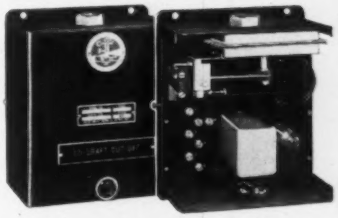
"Lectricarm" Drive Unit—Powerful, reversible, all electric, remote controlled drive unit. Responds to impulse from damper control and steam control. Operates with great accuracy without hunting or over-running.

CLEVELAND
STEAM CONTROL

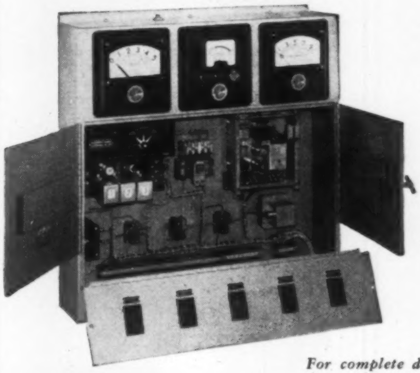
Steam Control—Compact master regulator, for accurate, automatic regulation of steam pressure from stoker, gas or oil-fired boilers. Highly sensitive—holds pressure to + or − 1% of required setting. Saves fuel by preventing "over-firing", controlling fuel and air, eliminating "stop and start" firing.



Cleveland Gages for indicating draft, air pressure, flue gas temperature and smoke conditions are essential to maximum boiler operating efficiency. The engineer who knows these conditions can operate the boiler plant with minimum loss. Complete line of gages includes single and multi-pointer units with wide selection of scales.



"Lo-Draft" Cut-Off Control—Safety device engineered to prevent explosion or damage to boiler by automatically cutting off burner when draft fails. Time delay prevents nuisance shutdowns due to momentary low draft. Provides positive, fail-safe protection by sampling draft in combustion chamber or at breeching. Signal light gives visual warning of momentary or sustained draft failure.



Control Panel Board Cabinets—Factory assembled, packaged control cabinets group all primary burner controls, flame safeguards, gages, fuses, circuit breakers, etc., in one neat, compact cabinet. Constructed of heavy gauge steel, it accommodates damper control and other required CFE units, plus additional equipment specified or furnished. Size of cabinet 34"x 34"x 8".

For complete detailed information on these and other combustion instruments and controls fill in and mail attached coupon.

COMBUSTION INSTRUMENTS & CONTROLS
CLEVELAND FUEL EQUIPMENT CO.
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☐ "Lectricarm"
☐ Steam Controls
☐ Gages
☐ "Lo-Draft" Cut-Off
☐ Control Cabinets

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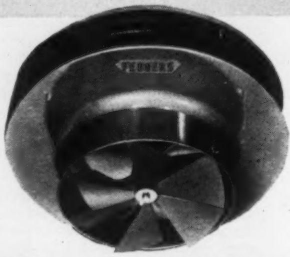
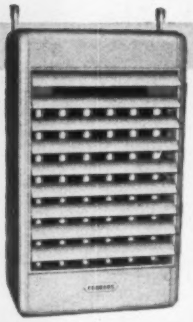
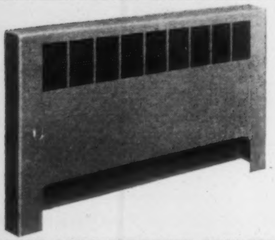
FEDDERS SERIES 17 UNIT HEATERS combine handsome cabinets and reliable efficient performance.



FEDDERS SERIES 16 DOWNBLOW UNIT HEATERS for high and spot locations. Available with radial louvers, cone and Anemostat diffusers.



FEDDERS SERIES 18 GAS-FIRED UNIT HEATERS are self-contained and require no boilers and long runs of steam lines.



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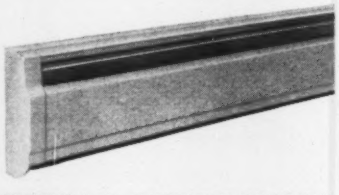
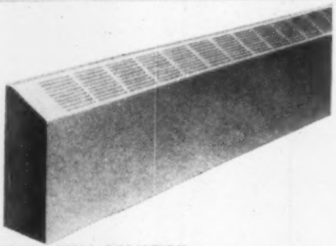


FEDDERS I=B=R APPROVED BASEBOARD RADIATION... new functional design blends with any room decor. Dampers standard equipment.



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HOT WATER
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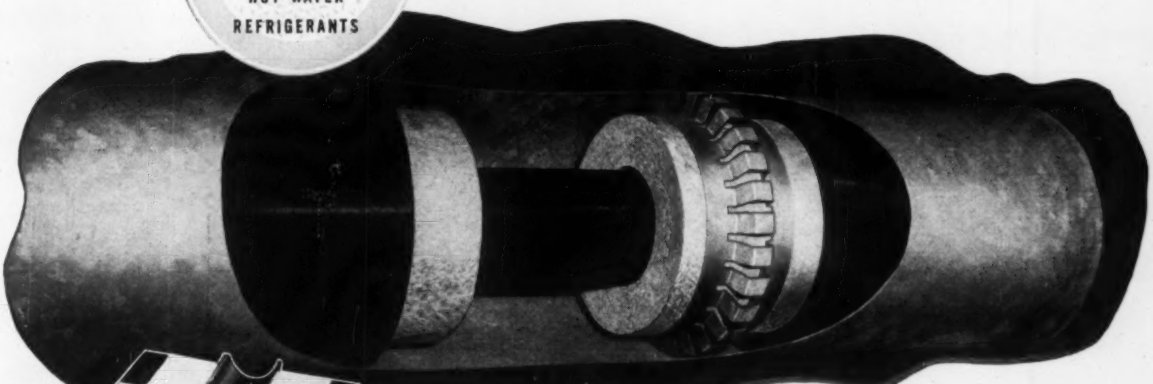

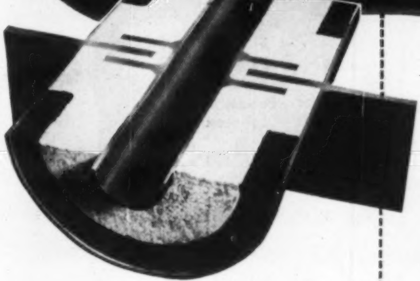

Durant Patented Insulated Anchor

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now available

A new 54 page catalog. A complete description of D.I.P. Insulated conduit together with general and practical information on underground insulated piping systems. Write for Catalog D-35.

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This means: deterioration of the metal casing underground is of no concern. Years of service and even complete submersion do not harm D. I. P.

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This means: water or moisture cannot pass through support points to the insulation or pipe. It means efficient insulating properties and extreme durability.

- Durant's Patented Insulated Anchor eliminates contact between anchor plate and pipe.

This means: reduced heat loss and elimination of corrosive electrolytic action at anchor points.

Many other advantages come with D. I. P.—such as low cost installation, for the Durant field joint can be made swiftly and easily. D. I. P. does not require external casing-welding: nor does it require concrete tunnels, slabs, rollers, supports, drains or additional protection for superimposed loads—such as under roadways or railroad tracks.

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GRABLER

SQUARE "GEE" PIPE HANGERS

Are Time-Cost Saving Tools

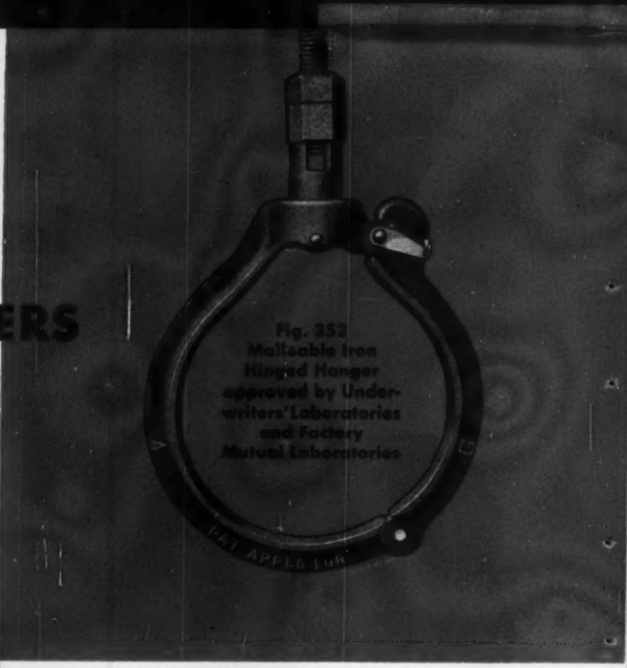
Fig. 352
Malleable Iron
Hinged Hanger
approved by Underwriters' Laboratories
and Factory
Mutual Laboratories

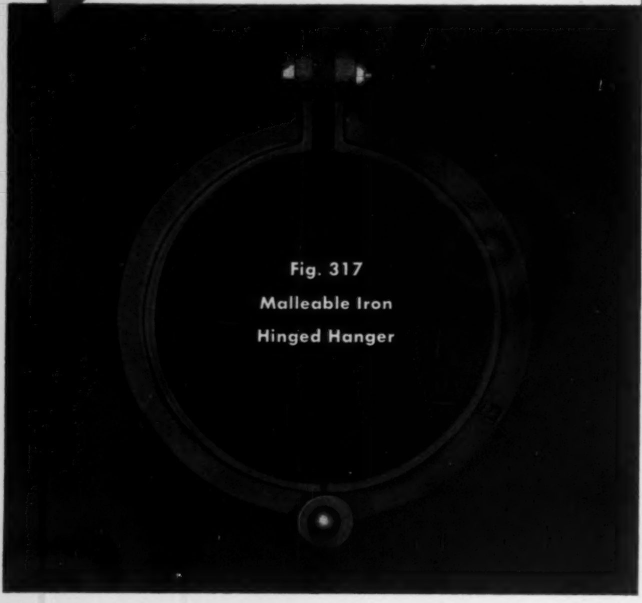
Fig. 317
Malleable Iron
Hinged Hanger

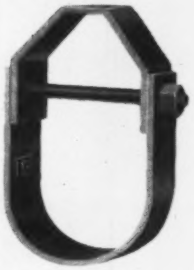
Fig. 97
Steel Clevis
Approved by
Underwriters'
Laboratories and
Factory Mutual
Laboratories

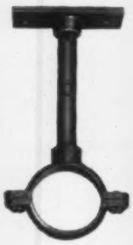
Fig. 65
Split Ring Hanger
with
Nipple and Plate

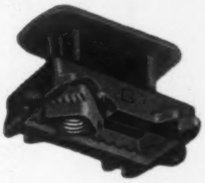
Fig. 315
Concrete Insert Approved
by Underwriters'
Laboratories and Factory
Mutual Laboratories

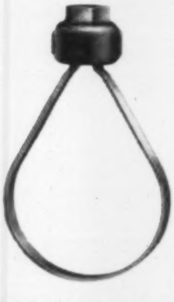
Fig. 367—Zinc Plated Steel
Hanger with Malleable
Nut, Approved by Underwriters' Laboratories and
Factory Mutual
Laboratories

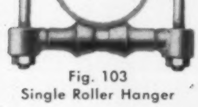
Fig. 103
Single Roller Hanger

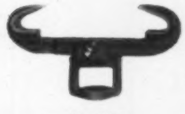
Fig. 392
Malleable
Iron Adjustable,
I Beam Clamps

CHECKING YOUR TIME-COSTS can reveal important assembly and installation cost reductions when Square "GEE" Pipe Hangers are used.

You will discover that Grabler Square "GEE" Pipe Hangers are time-cost saving tools—tools that can give relief from time-wasting grief on your next plumbing and heating job. Square "GEE" Pipe Hangers are designed, fabricated and tested to comply with modern engineering and construction practices. Ask your wholesaler for Grabler Square "GEE" Pipe Hangers.

THE SQUARE "GEE" LINE INCLUDES:

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That's what they said the day before Pearl Harbor. Remember? But by now you'd think people would have learned. Let's face it—we must be ready for disaster at any moment. It may be an atom bomb—or it may be a fire, a flood, a hurricane. It's only common sense to be prepared for it, whatever it is. Take these precautions TODAY:

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- ☐ **Check contents** and locations of first-aid kits.
- ☐ **Send staff** to Red Cross courses. They may save your life.
- ☐ **Promote preparedness** in your community. Your local CD Director can show you how.

Set the standard of preparedness in your plant city—check off these four simple points NOW.

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"Tippecanoe and DURIRON, too!"

The new
Tippecanoe Laboratories

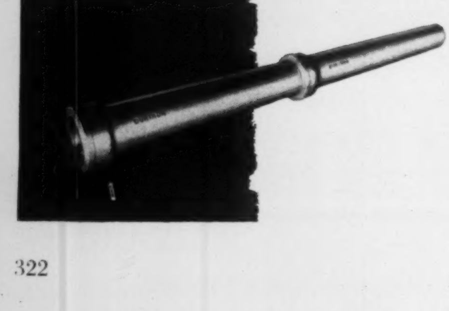
ELI LILLY AND COMPANY
Lafayette, Indiana

with DURIRON Corrosion Resisting Drain Lines

Eli Lilly and Company is one of the country's largest manufacturers of pharmaceuticals and biologicals. At their new Tippecanoe Laboratories, where they are producing chiefly Ilotycin (Erythromycin, Lilly) and other antibiotics, Duriron has been installed for the corrosive waste disposal lines.

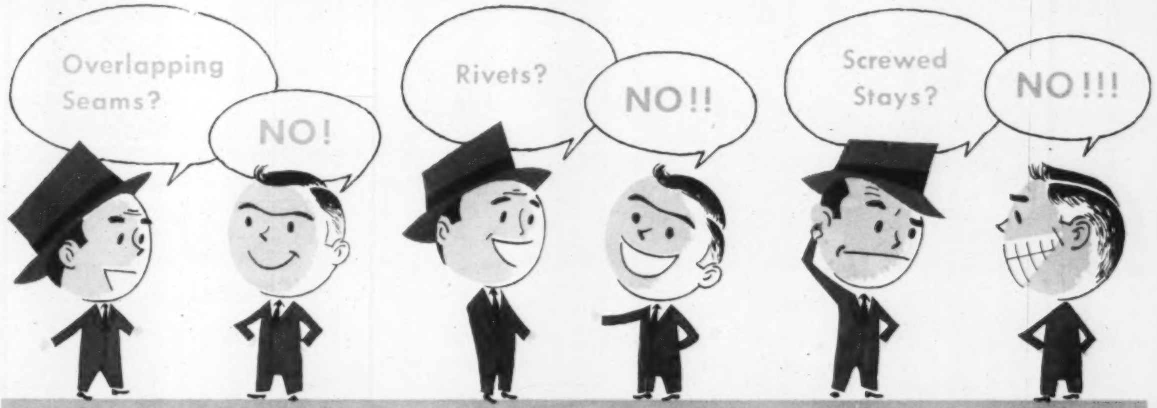
Duriron acid-proof drain pipe and fittings are used wherever there is a severe corrosion problem—in laboratories, schools, hospitals, and industrial buildings. Wherever *permanence* is a must, *Duriron* is a must. The first cost is last cost. For the life of the building, insist upon Duriron.

Full details are contained in free catalog PF/4



THE DURIRON COMPANY, Inc.
Dayton, Ohio

DURIRON
LOOK FOR THE NAME ON EVERY PIECE

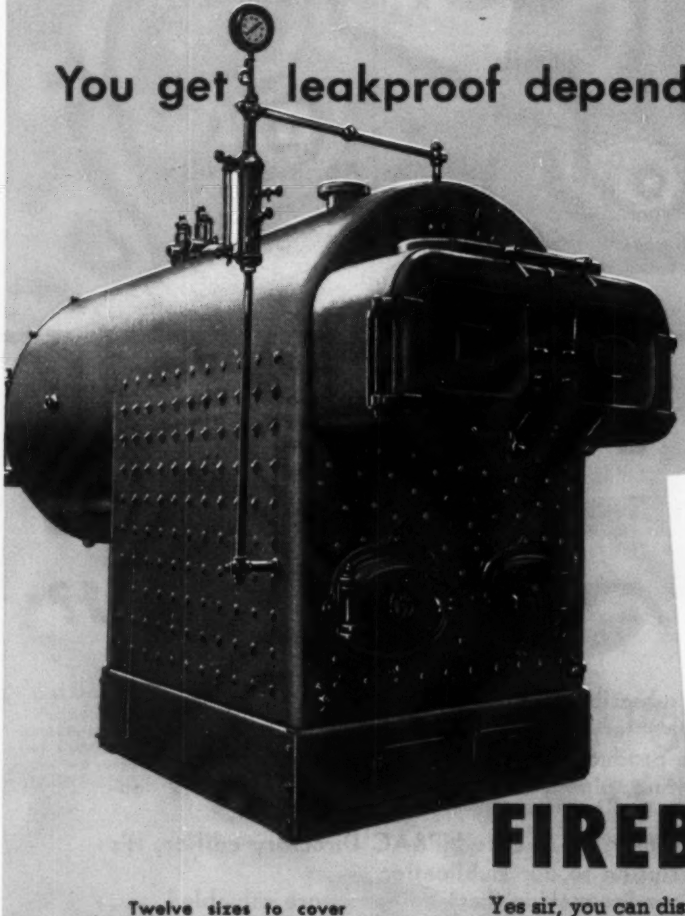

Overlapping Seams?
NO!
Rivets?
NO!!
Screwed Stays?
NO!!!

You get leakproof dependable performance with the

All-Welded All-Around

TITUSVILLE Type WP

FIREBOX BOILER



Twelve sizes to cover service requirements from 25 H.P. to 304 H.P.

Yes sir, you can dismiss leak worries with the Titusville WP—this precision-formed, fusion-welded boiler remains tight under all operating conditions, and is the satisfying answer to your demand for high efficiency and low maintenance at sensible cost. Ask for latest Bulletin B-3030.

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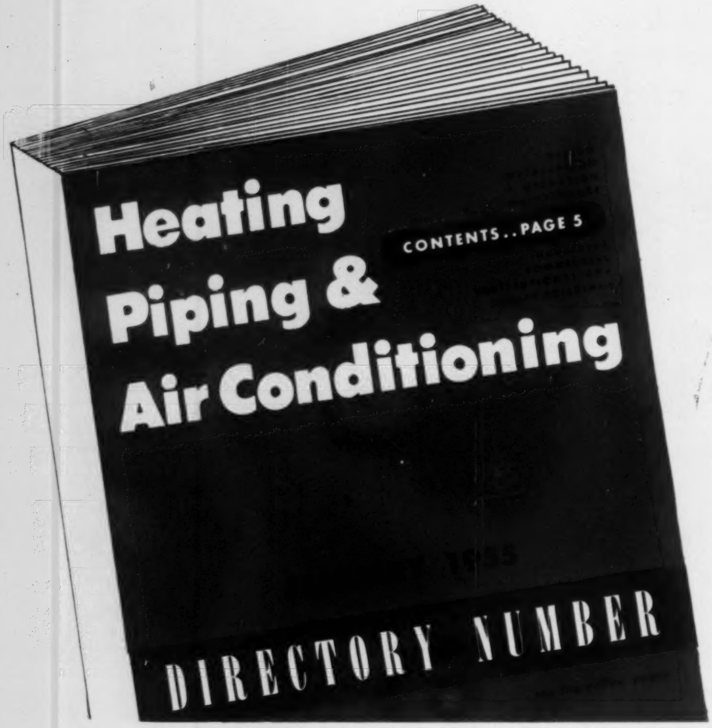
Manufacturers of A Complete Line of Boilers for Every Heating and Power Requirement



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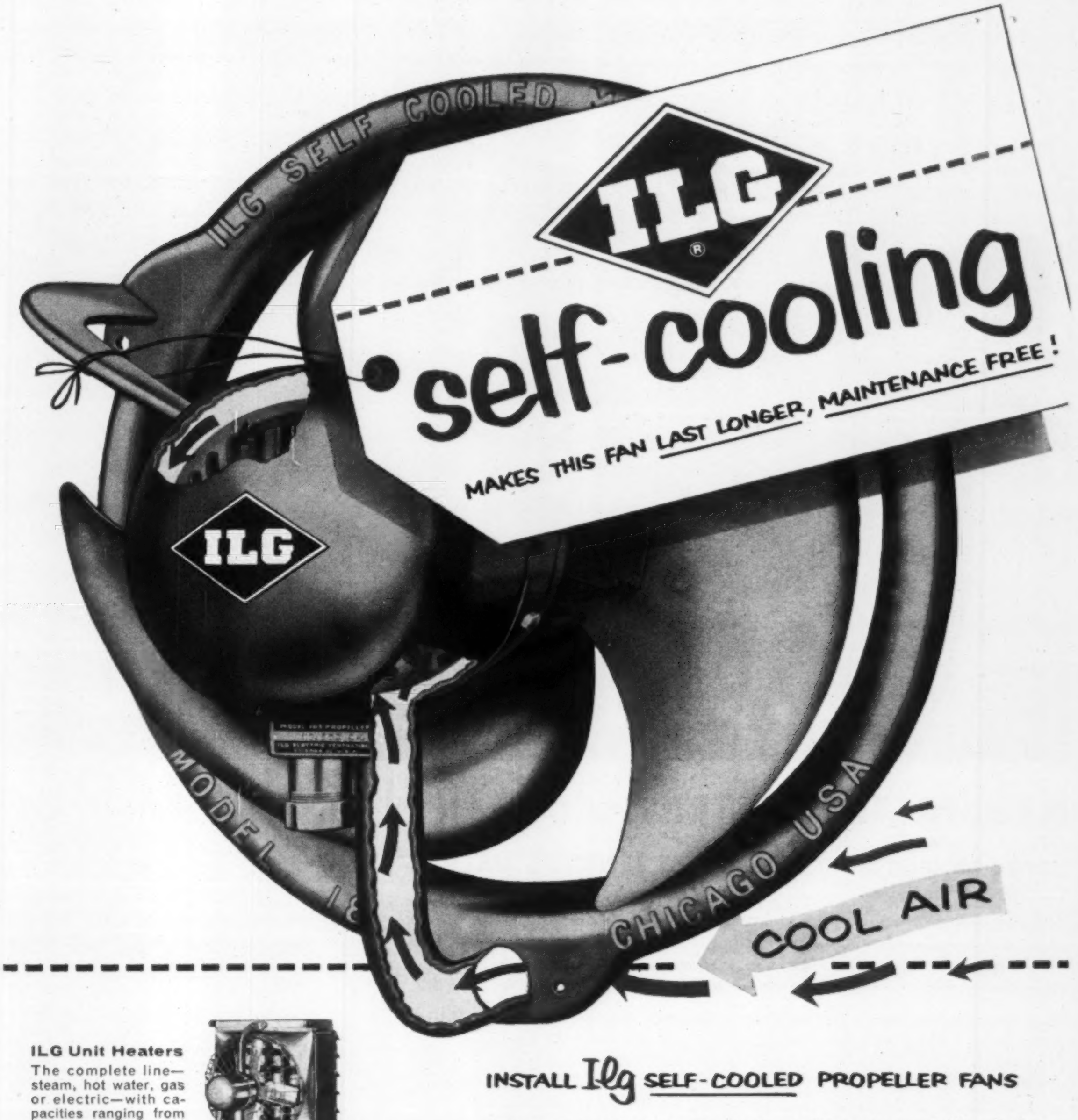

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The secret of ILG's better design is the exclusive *self-cooled* motor! Clean, cool, fresh air is drawn into the fully enclosed motor through an *outside vent pipe*. The motor stays clean and cools itself — dusty, greasy air can never reach it to interrupt service or shorten its life! ILG self-cooled fans have the lowest operating and maintenance cost of any open type motor fan combined with a fully enclosed motor . . . a savings up to *10% on power costs alone!*

ILG Unit Heaters

The complete line—steam, hot water, gas or electric—with capacities ranging from 18,600 to 286,000 BTU.

ILG Centrifugal Fans

Designed for a wide variety of pressure and volume requirements — certified capacities ranging from 374 CFM to 116,400 CFM.

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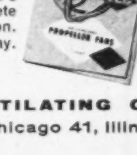
Long-lasting, quiet, easy to install, leak-proof—provide efficient ventilation independent of wind and weather.



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Here's the information you should have before planning your ventilation requirements. ILG's new Propeller Fan Catalog is your complete and authoritative guide to better ventilation. Write for your catalog No. 151 today.

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2850 N. Pulaski Road, Chicago 41, Illinois

for this sparkling "showcase of service"
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Photo: Ezra Stoller

MANUFACTURERS TRUST COMPANY

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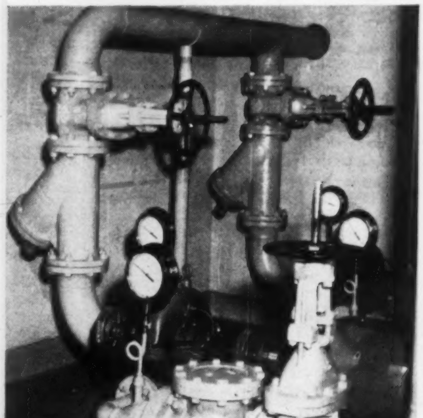
Mechanical Engineers: SYSKA & HENNESSY, INC.
General Contractors: GEORGE A. FULLER COMPANY
Heating, Ventilating, and
Air Conditioning Contractor: BAKER, SMITH & CO.
Interior Design Consultant: ELEANOR LE MAIRE

The new 5th Avenue office of Manufacturers Trust Company is a striking departure from traditional bank design . . . for practical purposes. The many innovations are carefully calculated to permit greatly increased efficiency in service . . . to pioneer a merchandising concept new in banking.

Its glass walls include the largest series of panes ever erected, yet the building is technically windowless. Air conditioning, together with all other mechanical facilities, was carefully planned to provide uninterrupted comfort and convenience. Jenkins Valves were selected for all air conditioning, cooling, and heating lines, as in so many of today's buildings that set the pace for future-minded design.

Confidence in the *extra measure* of efficiency and economy assured by Jenkins standards is shared by leaders in every field of construction. Despite this extra value, *you pay no more* for Jenkins Valves.

For new installations, for all replacements, let the Jenkins Diamond be your guide to lasting valve economy. Jenkins Bros., 100 Park Ave., New York 17.



These Iron Body Gate and Check Valves on air conditioning service lines are among the many Jenkins Valves installed throughout the new bank with the "open look".

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LOOK FOR THE JENKINS DIAMOND
VALVES
SINCE 1864 TRADE JENKINS MARK
Jenkins Bros

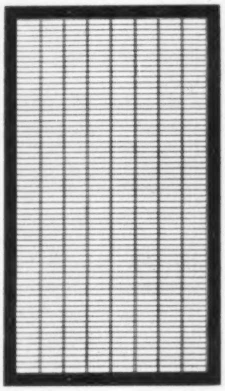
EQUIPMENT DEVELOPMENTS...

For reviews of Recent Trade Literature see Page 360

Combustion Safeguards

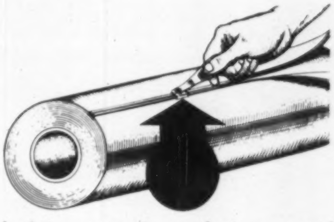
The "Flame-otrol" electronic combustion safeguard systems for oil and gas fired furnaces, ovens, boilers, etc., incorporate a plug-in type chassis, their manufacturer reports. Design is such that accessibility is available for adjustment, examination and control. A captive screw locks the chassis in position. Components are housed in an industrial type steel cabinet. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

Gymnasium Grille



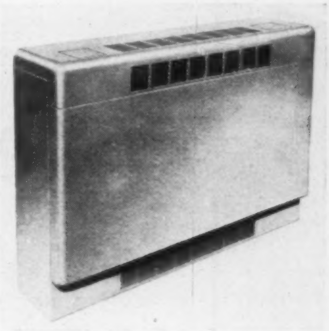
Designed to withstand the conditions of school gymnasium use, a new grille is of rugged construction and has smooth contours and no sharp corners or points, its manufacturer reports. The grille is made in two models; "G1," which is grille face only, and "G2," which is grille face combined with a volume controller. The volume controller features solid section extruded aluminum louvers, the company states. The grille face has 14 gage round edge flat wire steel blades and has vertical steel support bars placed on 6 in. centers. Titus Mfg. Corp., 113 E. 8th St., Waterloo, Ia.

Pipe Covering Finish



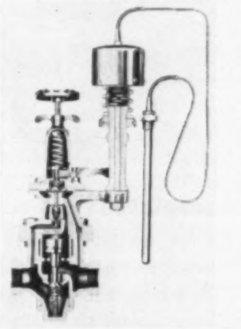
A prefabricated poly-vinyl chloride acetate pipe covering finish, designed to protect insulation against weather, abrasion, chemicals, etc., is furnished in exact size and zips on and locks in place, according to its manufacturer. "Protektinsul," as the finish is called, provides an airtight, watertight, and vaportight longitudinal joint, says the company. Miracle Adhesives Corp., 214 E. 53rd St., New York 22.

Remote Type Air Conditioner



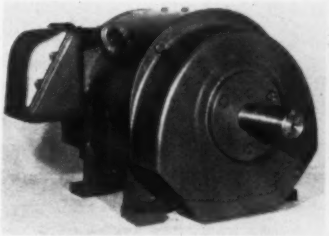
"Roomaire" conditioner, a remote type room air conditioning unit subject to individual room control, is designed to provide the services of cooling and dehumidifying, heating, ventilating, cleaning and circulating air, its manufacturer reports. For cooling, chilled air is circulated through the coil into the unit; and for heating, hot water is used. Three pipes serve each unit—water supply, water return and drain. All electrical and piping connections are made to the unit. Young Radiator Co., 709 S. Marquette St., Racine, Wis.

Pressure-Temperature Regulator



As temperature tends to vary, a thermostatic control unit acts upon the manufacturer's pressure regulator to reduce or increase steam pressure. Pressure modulates between the initial setting and zero to prevent over-run, the company states. The unit is available in six temperature ranges. Sizes are ½ to 2 in. with screwed ends and 2½ to 6 in. with flanged ends. O. C. Keckley Co., 400 W. Madison St., Chicago 6.

Industrial D-C Motors



A new line of industrial direct-current motors, the manufacturer's "Super 'T'," is designed to produce fast and accurate response. This feature, called "Dynamic Response," has been built into these motors to meet industry's growing demand for automation, the company says. Motors are being produced in sizes from 20 to 100 hp. Reliance Electric and Engineering Co., 1088 Ivanhoe Rd., Cleveland 10.

Pressure Relief Valve

BOILER
DRAIN

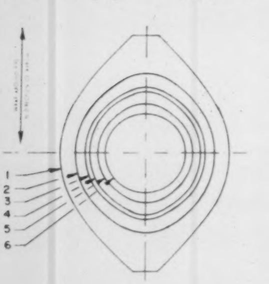
A new valve, the manufacturer's No. 750, has a relieving capacity of 750,000 Btu/hr, the company reports. It employs a new type of silicon disc seat. Tests have shown this material to be impervious to excessive temperatures, and but a very small pressure differential is required to close the valve after pressure is relieved, states the manufacturer. Bell & Gossett Co., 8200 N. Austin Ave., Morton Grove, Ill.

Steam Trap

A steam trap that, according to its manufacturer, vents air out of steam consuming units faster than ordinary inverted bucket traps or air eliminator or blast type traps, is recommended by the company for autoclaves, unit heaters, dryers, and other production units. This venting is accomplished through the use of two separate orifices, one for condensate and a separate bellows orifice for air. Sizes of traps range from ¾ to 1¼ in., suitable for pressures to 150 psi. The V. D. Anderson Co., 1935 W. 96th St., Cleveland 2.

Wrap-Around Pipe Templates

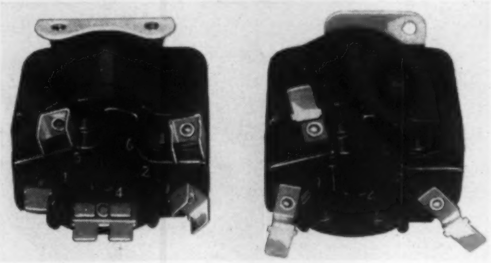
A template designed to be an inexpensive aid to accurate pipefitting, has a table showing sizes of pipe for which it may be used. Long border lines of template equal the circumference of the pipe. The template is used by wrapping it around the pipe, taping it in place, and centerpunching the contour line. The template is then removed and the pipe is cut on the inside of the centerpunch marks. Templates are available for all standard pipe sizes from 2 to 20 in. Ree Associates, Bogota, N.J.



Air Filter

A filter designed for efficiency filtering at low cost and with low pressure drop for commercial and industrial ventilating and air conditioning systems was developed for a wide range of applications where the extreme efficiency of a more exacting unit is not required, the manufacturer reports. The device consists of a cadmium plated steel frame, which contains an assembled, replaceable filter cartridge. Cambridge Filter Corp., 738 Erie Blvd., E., Syracuse.

Quick Disconnect Terminals

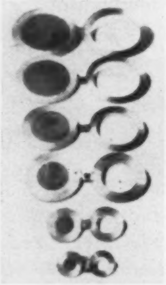


Manufacturer has announced the availability of male quick disconnect terminals on his potential motor starting relays. These terminals will fit female connections of the "Ark-Les" or "Amp" type, the company says. They are available with either horizontal or vertical connections. The relay on the left in the illustration above shows the maximum terminal arrangement available. R-B-M Div., Essex Wire Corp., Logansport, Ind.

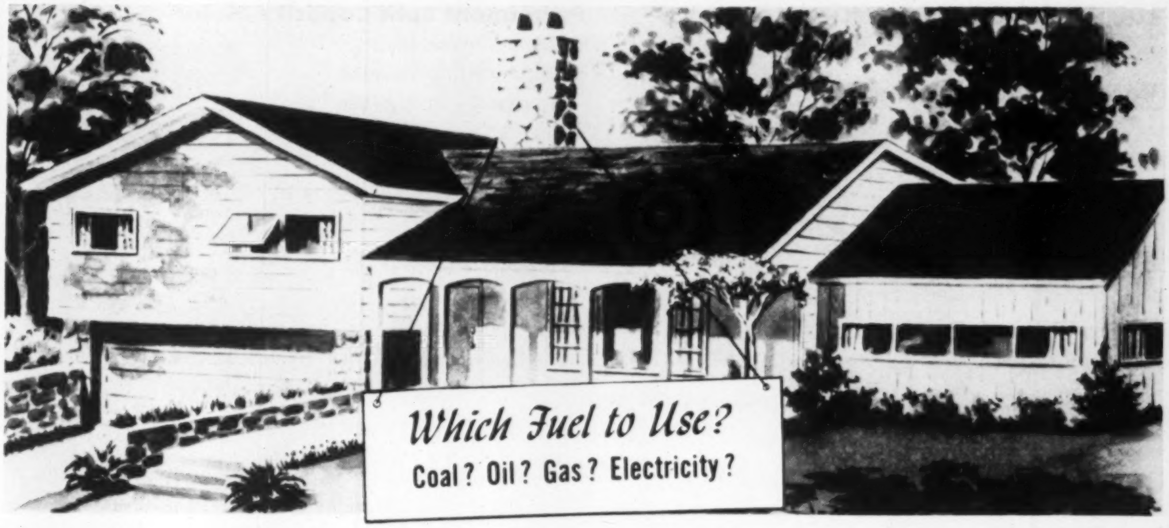
Pneumatic Hammer Kit

A pneumatic hammer kit, recommended by the manufacturer for installation and repair of heating and air conditioning systems, features a new style hammer barrel, which has a removable inner sleeve and replaceable nozzle, says the company. The kit includes a chisel, scraper, rivet cutter and panel cutter, each made of chisel alloy forged steel. Skil Corp., 5033 Elston Ave., Chicago 30.

Figure Eight Cutoff Flange



Designed for the petroleum, chemical processing and allied fields, the figure eight flange fits between the flanged joints of a pipe line. The flange is made in two sections, a disc and a ring, and joined by welding. That part not in use is exposed, giving a signal to line men showing whether the line is open or closed. Flanges are machined for gasket seating or may be supplied for ring type joints, according to the manufacturer. H. F. Butler, Inc., P. O. Box 121-55, Union, N. J.


Which Fuel to Use?
Coal? Oil? Gas? Electricity?

Even wood is still appropriate—in a cheerful fireplace; or charcoal in an outdoor grill. But for winter warmth, what fuel gives most comfort at least cost?

For summer coolness, shade trees are often relied on; also water evaporating on roofs. Electricity is widely used to operate mechanical cooling systems. How can its cost be reduced?

The problem is to find the fuel subject to the least loss in Btu's from Radiation, Convection, Conduction, and Vapor Flow, which are responsible for *all* heat loss, regardless of what fuel is used or how heat is supplied.

Through wall, ceiling and floor *spaces*, the greatest amount of heat loss is by *radiation;* up to 55% for Up-Heat-Flow, 80% for Wall-Heat-Flow, and as much as 93% for Down-Heat-Flow. Little heat is lost by *conduction* through building spaces because air has slight density. *Convection* accounts for up to 45% of Up-Heat-Flow, about 25% for Wall-Heat-Flow, and Zero for Down-Heat-Flow because there is no downward Convection.

WHICH FUEL TO USE?

In the case of Radiation, regardless of the kind of fuel, heat loss is reduced by *multiple* accordion *aluminum* as each sheet successively *reflects* Radiation or heat rays back in the direction of the source at a high 97% rate, absorbing them at a low 3% rate, and emitting heat rays at a mere 3% rate.

The 3 or 5 sheets of aluminum and fiber partitions effectively retard outer and inner Convection, also regardless of the kind of fuel. Since their 4 or 6 layers of air spaces have slight density, heat loss by Conduction through them is also slight.

1,060 Btu's are lost with each pound of vapor which flows out of a building, enough to raise by 20° F the temperature of 2 rooms, 8 feet high, 13 by 14 feet in size. Thick, continuous aluminum foil, 375 feet to 750 feet long (which means mighty few breaks for infiltration of vapor), has almost *zero* permeability to vapor flow. Under its flat stapled flanges, infiltration is slight.

Infra Insulation Inc., 525 Bway., N. Y. C.

The new, **edge-to-edge, UNIFORM-DEPTH,** joist-to-joist Multiple Accordion Aluminum* Insulation reduces heat loss by Radiation, Convection, Conduction, and Vapor Flow at so low a cost, that—

its use in ceiling, wall and crawl spaces, or under ground floors will make ANY preferred fuel economical.

FREE! ASHVE BOOKLET AND RADIATION TABLE

How thermal losses can be reduced by successive "screens" of metal and air layers is described in the booklet, "Insulating Effect of Successive Air Spaces Bounded by Bright Metallic Surfaces" published by the American Society of Heating and Ventilating Engineers. This report is well worth reading. Obtain it free—Use the Coupon.

Check coupon to get useful Table of the heat ray reflectivity of a long list of materials.

*Patent applied for.

COST OF EDGE-TO-EDGE INFRA
Multiple Aluminum Insulation
installed in new construction between
wood joists, material and labor
Type 6-S under 9½¢ sq. ft. Type 4-S under 7½¢ sq. ft.

Infra Insulation Inc., 525 Bway., N.Y.C. Dept. H-1

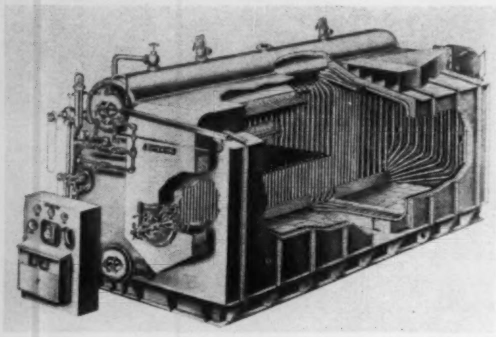
Please send ☐ ASHVE booklet, "Insulating Effect."
☐ Heat ray reflectivity table.

NAME____________________________

FIRM____________________________

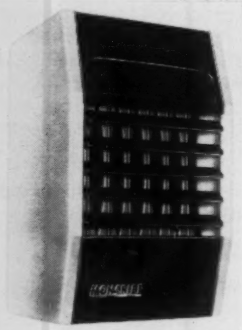
ADDRESS____________________________

Packaged Steam Generator



Shown here, in cutaway view, is one of the manufacturer's new type "D" steam generators, which are assembled and fire tested at the factory before shipment. Units are designed for firing with gas, a variety of fuel oils, or both, and are performance rated by the company at capacities up to 40,000 lb per hr continuous steaming. A feature cited by the manufacturer is a rear mounted forced draft fan providing an air cooled furnace roof. Superior Combustion Industries, Inc., 1475 Broadway, New York 36.

Gas Fired Unit Heaters

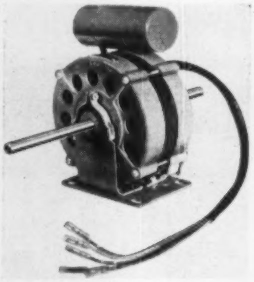


A restyled line of gas fired unit heaters features a casing with tapered adjustable louvers, the manufacturer reports. The units are to be built in sizes of 60,000, 80,000 115,000 and 170,000 Btu input. Features cited by the company are compact, welded, one piece heating elements; ribbon type gas burners designed to operate quietly and to be easily removable; propeller type fan units with rubber mountings; welded-on pipe hangers for ease of installation; and factory assembly so that the units need only be attached to gas and electrical connections. The Henry Furnace Co., Medina, Ohio.

Relief Valves and Electronic Controls

Exhibited at the First International Instrument Congress and Exposition, held in Philadelphia recently, were over 120 different products of a single company, their manufacturer reports. Featured was the company's new line of safety relief valves. Also shown at the exhibit was a new electronic process control system which measures and controls such industrial process variables as reaction temperature, steam pressure and fluid flow. Manning, Maxwell & Moore, Inc., 250 E. Main St., Stratford, Conn.

Permanent Split Capacity Motor



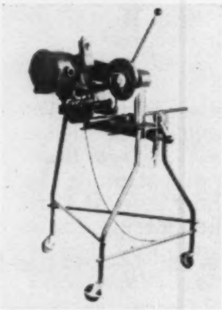
The manufacturer's model "6000" permanent split capacity motor has high efficiency, high power factor, cool operation, long bearing life without oiling, high starting torque and quiet operation, according to the company. Is rated at 1/12 and 1/20 hp for installation in window air conditioners. Howard Industries, Inc., Racine, Wis.

High Voltage Starter

"Air-Break" starters designed for 2200-5000 volt squirrel cage, wound rotor and synchronous motors are built in three styles: 50,000 kva interrupting capacity; with power fuses for systems of 150,000 kva (2300 volt) and 250,000 kva (4600) availability; and in the "Valimitor" (volt-ampere-limitor) style in which air core reactors limit infinite kva to a finite value within the rating of the starter, the manufacturer states.

Incorporated in the complete starter are a safety door switch on the disconnect switch compartment, swinging overload panel, self contained bus for group installation, meters as required and removable cabinet doors. The Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland 4, Ohio.

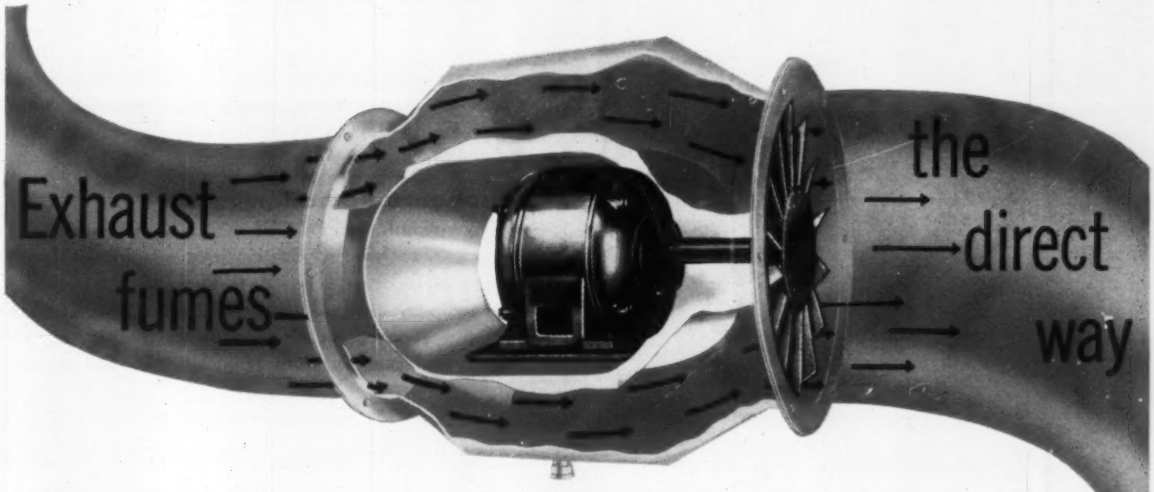
Portable Cutting Unit With Deburrer



Built into the manufacturer's portable 10 in. abrasive cutting unit is a deburring attachment which makes square burnished ends on cut material without clamping or using blades, according to the company. The unit is designed to cut tubing up to 1½ in. OD, 1 in. standard pipe and solid bars, and structural shapes to 2 in., the company reports. The cutter has a 1½ hp, 220/440 volt, 3 phase, 60 cycle motor. Wallace Tube Co., 1304 Diversey Pkwy., Chicago 14.

Submersible Pump

A new submersible pump, designed for deep wells to 280 ft and for providing capacities up to 940 gph from the shallower settings, is available in ½, ¾ and 1 hp models. The pump consists of a sealed motor and a multi-stage turbine pump with dynamic impellers and smooth water passages that are exclusive in design to the manufacturer, the company states. A construction feature of the pump provides protection to the



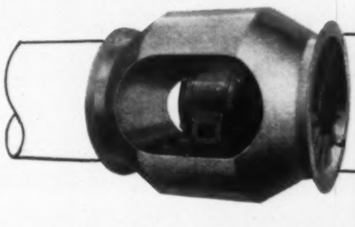
BIFURCATOR FAN EFFICIENTLY EXHAUSTS HOT, CORROSIVE, FLAMMABLE AND EXPLOSIVE FUMES

Bifurcator Fans exhaust fumes at *top efficiency* by avoiding a directional change in the air stream. Other fans often require a 90° change in direction of the exhaust stream with resultant loss in efficiency.

The fan motor stays clean, cool and accessible. Fumes are by-passed (bifurcated) around the motor chamber which is completely isolated from the exhaust stream.

A Bifurcator Fan is easily installed . . . just like a flanged section of ductwork. It can be mounted horizontally, vertically or at an angle. Lightweight and extremely compact, a Bifurcator requires no platform or supports. Bifurcators are available in sizes from 1140 CFM (12" diameter fan with 1/20 HP motor) up to 45,000 CFM (48" diameter fan with 20 HP motor). Housings and fan wheels can be fabricated of non-corrosive metals, or can be protected with a variety of corrosion-resistant coatings.

Be ready with the facts about Bifurcators next time you have a fume removal problem. Fill in and mail the handy coupon below . . . TODAY!



Bifurcator Fan installs just like a section of ductwork.

BIFURCATORS
a summary of design data for exhaust systems

"DESIGN DATA FOR EXHAUST SYSTEMS"
This helpful bulletin contains details, simplified data and charts. Compiled by Allen D. Brandt, Senior Sanitary Engineer, U. S. Public Health Service. Mail coupon for your FREE copy and Bifurcator Bulletin.

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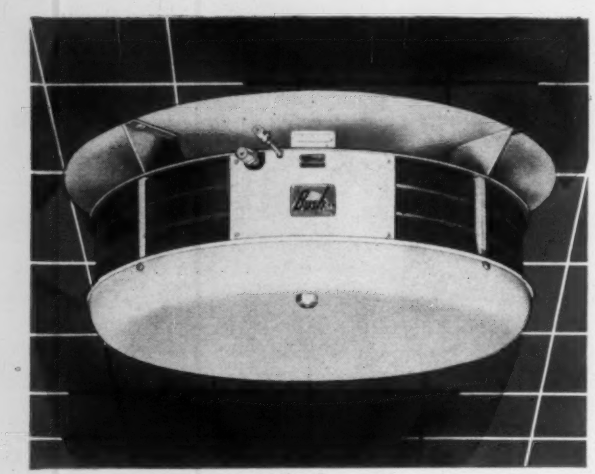


DOERR Motors

solve problem

on Bush Jet Coolers

Ceiling Jet Unit Coolers, a product of the Bush Manufacturing Company, of West Hartford, Connecticut, have the responsible job of maintaining continuous low temperatures in cold storage rooms. This calls for reliable motor operation, usually in the presence of high humidity.

The Doerr 1/10 hp, 1140 rpm, Type C, permanent split capacitor motor selected had to be suitable for replacement in existing units in the field. The band mounting used restricts the frame diameter and height is also at a premium. The unusual method shown for mounting the capacitor provided the answer and has simplified assembly in both production and in servicing.

This is another instance where Doerr has helped with a special design. If you have an unusual motor problem, please let us hear from you.

Visit us in Booth C-121, Heating & Ventilating Exposition, Philadelphia, January 24-28.

YOU GET MORE with DOERR!

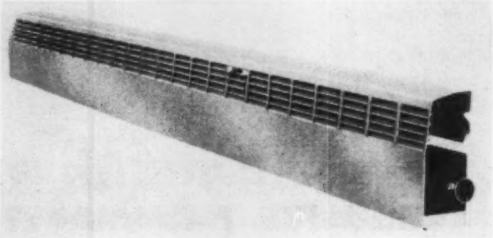
DOERR
Electric Corporation
CEDARBURG, WISCONSIN

Electric Motors from 1/30 to 5 hp. Standard or designed to your specifications.

motor's electric cable by placing it inside the casing sleeve, according to the manufacturer. Peerless Pump Div., Food Machinery and Chemical Corp., 301 West Ave. 26, Los Angeles 31.

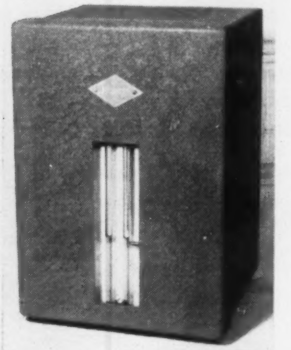
Baseboard Radiation

The manufacturer's "BE-12" line of baseboard radiation, with increased capacity, is applicable to new or remodeled schools, factories, hospitals, etc., the company reports. Baseboard may be installed partially recessed or flush with the wall. Angular louver grill punched into front of enclosure directs warm air out into the room to minimize wall smudging, says the manufacturer. The heating element has self spacing fins. C. A. Dunham Co., Dept. D, 400 W. Madison St., Chicago 6.



Differential Level Monitor

Utilizing bubble-tube principles of differential static pressure, a control manometer, and a relay actuating electronic switch, the manufacturer's model "DL" differential level monitor finds application in the chemical, water works, utility, power generation and similar operations where it is necessary to measure or maintain a limited level differential between two points, the company reports. The instrument is designed to measure water level differential between the upstream and downstream sides of a screen and to actuate the screen cleaning mechanism whenever the differential exceeds set limits—indicating that the screen is filled. Thermo Instruments Co., 1310 Old County Rd., Belmont, Calif.



Hose Valves

New lines of industrial air hose valves and rubber covered hose valves have been announced by their manufacturer. The air hose valve, for air blow applications, provides an air blast with finger pressure on the actuator. Features of the valve are tight shutoff and

Controlled Comfort·····B.B.*

*BEFORE BRUNNER

In days of old, all the King's horses and all the King's men . . . plus the royal fortune . . . couldn't come up with anything better than a simple fan to cool His Majesty's brow.

It took horsepower of another kind . . . electricity plus engineering and design knowhow . . . to create the modern version of "controlled comfort" produced by Brunner.

In air conditioning and refrigeration, Brunner equipment is unequalled for dependability and long life. Brunner design engineers "cut the cloth to fit the coat" . . . they design the product to meet specific performance standards.

That's why it's always wise to "sell Brunner" . . . because Brunner design engineering means better performance and lasting satisfaction for your customers.

As seen in
The Saturday Evening
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BRUNNER EXTRAS

- Compressor Experience
- Product Research
- Design Engineering
- Wide Product Range
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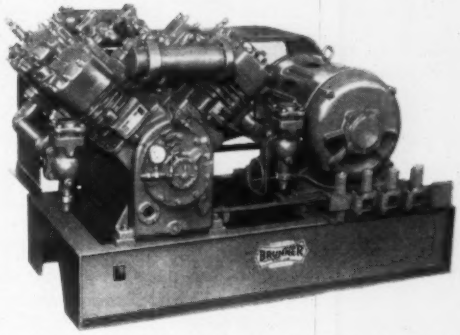


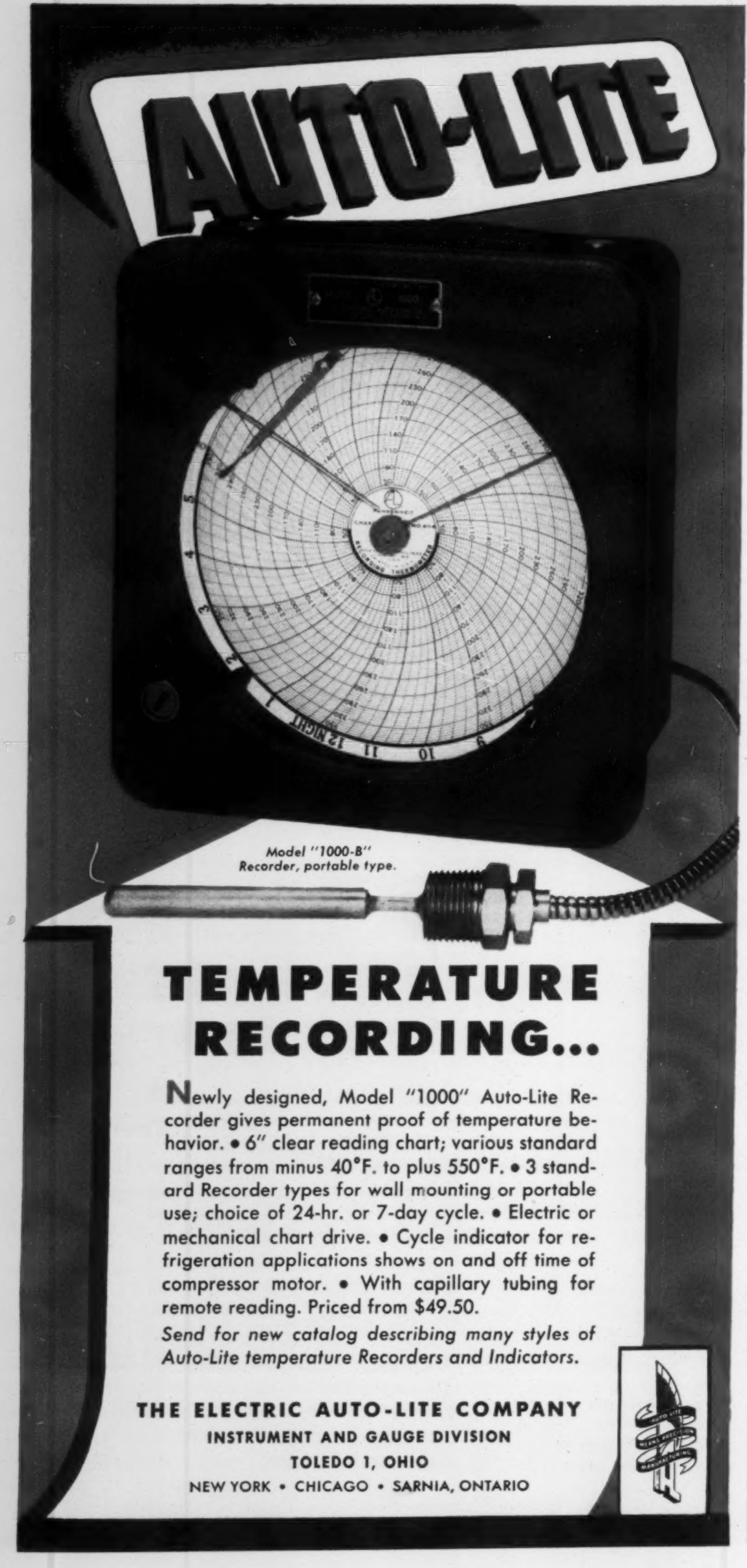
BRUNNER REFRIGERATION CONDENSING UNITS

for remote air conditioning installation in commercial and industrial applications, are supplied in sizes up to 75 H.P. with capacity control. Brunner Compressor Units for use with evaporative condensers also available up to 75 H.P.

The Brunner Compressor does *more* work with *less* motion. It's huskier than most ordinary compressors . . . larger pistons . . . longer stroke . . . bigger crank case . . . deep-finned heads. These construction features result in a quieter, more efficient compressor that gives extra years of service . . . with less wear on working parts, less maintenance, lower operating costs.

See your Brunner Representative for full information, or write to:

BRUNNER MANUFACTURING CO., Dept. L-155, UTICA, N.Y.
The Brunner Co., Gainesville, Ga.
In Canada: Brunner Corp. (Canada) Limited, Toronto, Ontario



Model "1000-B" Recorder, portable type.

TEMPERATURE RECORDING...

Newly designed, Model "1000" Auto-Lite Recorder gives permanent proof of temperature behavior. • 6" clear reading chart; various standard ranges from minus 40°F. to plus 550°F. • 3 standard Recorder types for wall mounting or portable use; choice of 24-hr. or 7-day cycle. • Electric or mechanical chart drive. • Cycle indicator for refrigeration applications shows on and off time of compressor motor. • With capillary tubing for remote reading. Priced from $49.50.

Send for new catalog describing many styles of Auto-Lite temperature Recorders and Indicators.

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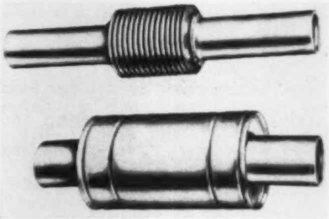
freedom from maintenance problems, since there are only two moving parts and no springs or levers, the manufacturer reports. With nickel plated bronze body and chrome ball disc, the valve has an overall length of 4 in. and weighs 5 oz.

The industrial rubber covered hose valves, for wash down and tank filling applications, are designed to provide bubble tight shutoff and are rubber covered to prevent accidental damage to tank and vessel linings. These valves also have only two moving parts, the company states, and are 5 in. long and weigh 1 lb. They will fit standard ½, ¾ or 1 in. ID hose. P-K Industries, Inc., 27 Porete Ave., North Arlington, N.J.

Expansion Joint

A new expansion joint is designed to compensate for thermal expansion, reduce vibration and noise transmission and to allow for misalignment in piping systems. It is recommended by the manufacturer for heating systems and any piping system subject to heating and cooling cycles. The joint, constructed around a special seamless bronze bellows, hydraulically formed, is available in three sizes for ¾, 1 and 1¼ in. piping systems. A protective secondary seal is provided at both ends of the joint as a safety factor against possible leakage due to damage to the joint or heating system. Clifford Mfg. Co., 152 Grove St., Waltham 54, Mass.

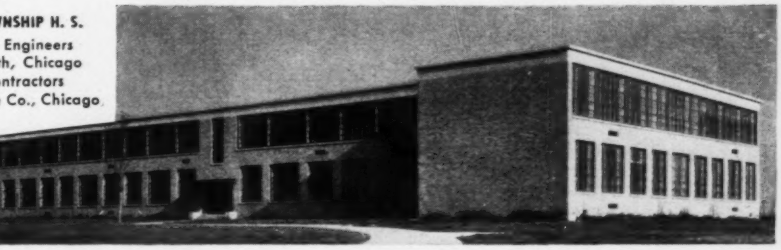


Heat Loss Calculator

The manufacturer's pocket-sized Btuh calculator is designed to aid in figuring heat losses due to window crackage. Made of vinyl plastic, the device operates like a slide rule yet reads like a table, showing correct

5-MILLION DOLLARS IN HIGH SCHOOLS

Gymnasium section, Hinsdale H. S.



HINSDALE TOWNSHIP H. S.
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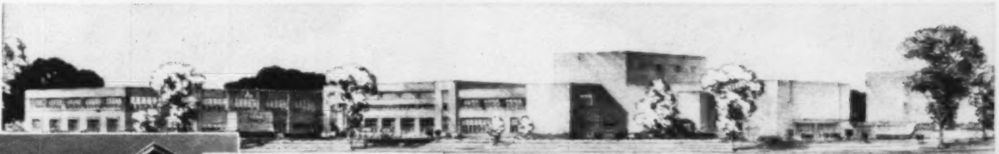
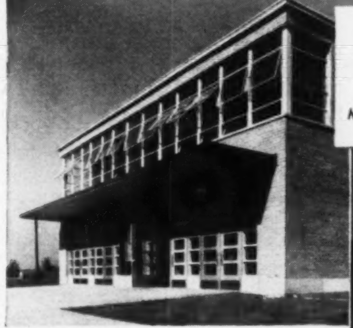
Childs & Smith, Chicago
Heating Contractors
William A. Pope Co., Chicago



Auditorium section, Maine Township H. S.



MAINE TOWNSHIP H. S.
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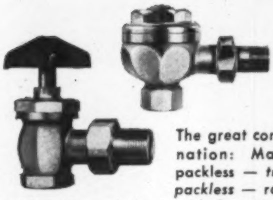
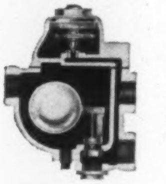
Childs & Smith, Chicago
Heating Contractors
M. J. Holleran, Inc., Chicago

Famous 600-ft. corridor, Maine Township H. S.

Marsh Valves and Traps all the way through



The great combination: Marsh packless — *truly packless* — radiator valve and the trouble-free Marsh thermostatic trap.



The Marsh float and thermostatic trap. There is a Marsh trap for every heating service.

The answer of three Chicago suburbs to the bumper crop of teen-agers . . . these two college-size high schools. Among America's largest and finest, they cost 5 millions and contain 337,000 sq. ft. of efficiently utilized floor space.

The fabulous, 3-million dollar expansion of Maine Township High will serve the suburbs of Park Ridge and Desplaines. Hinsdale High, a 2-million dollar high school, is for the young folk of famous Hinsdale alone. Who says we are not catching up with schooling needs? That 600 ft. corridor in the Maine Township school sets a standard of architectural design and quality construction never before found in the nation's schools.

For the best in buildings, the best in heating of course . . . and for the radiators and coils, the best in valves and traps. Hundreds of Marsh Packless Radiator Valves, Radiator Traps and F & T Traps went into the well designed heating systems which involve both direct and indirect radiation.

An excellent example, this — but only one of many examples of the respect for Marsh quality demonstrated on a nationwide scale in the selection of Marsh equipment by foremost architects and contractors. Ask for Catalog 76-H covering the full line of Marsh Heating Specialties.

MARSH HEATING EQUIPMENT CO., *Sales Affiliate of Jas. P. Marsh Corporation* **Dept. T, Skokie, Illinois**
Marsh Instrument & Valve Co. (Canada) Ltd., 8407 103rd St., Edmonton, Alberta

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in rotary oil burner sales and installations throughout the world*

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Again in 1954—as well as for 39 years previous—Ray Oil Burner led the field in sales of horizontal rotary commercial and industrial oil burners.

*"Ray has been first from the very first"**

No mere *boast,* this represents the opinion of American industry, an opinion backed up by the hard-boiled dollars of the world's wisest equipment buyers.

To you as a specifier, dealer or user of oil-fired heat, that record stands as an unqualified example of why your choice should be Ray—every time! There is a Ray Burner model to bring to every heat-receiver, Ray principles of efficiency, economy and performance, which have resulted in the record of 40 years of unchallenged sales leadership.

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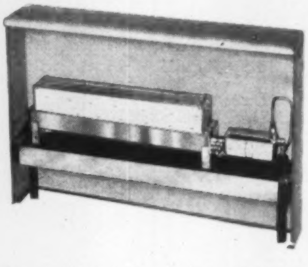
DISTRIBUTORS IN ALL PRINCIPAL CITIES OF THE WORLD

Btuh under a choice of 28 usage factors without interpolating. Sliding sleeve shows Btuh for any desired lineal feet of window or door crack under a choice of 15 infiltration factors. Common "U" factors and other reference material together with three scales appear on the back of the calculator. Paul S. Morton Engineering Services, 609 Bangor Rd., Lawrence, Mich.

Nonsparking Pipe Wrench

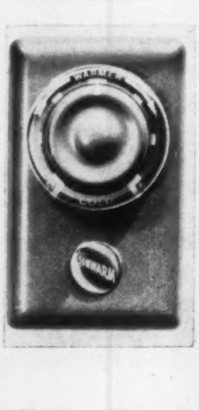
By using beryllium-copper insert jaws, the manufacturer's pipe wrench becomes nonsparking—a safety factor in hazardous areas where pipe lines must be added or changes in existing lines are to be made, the company says. The hook jaw is made of aluminum alloy. Wrenches are manufactured in 14, 18, 24 and 36 in. sizes. A line of wrenches with replaceable steel inserts in the same sizes is also available, the manufacturer reports. Frontier Bronze Corp., 4823 Packard Rd., Niagara Falls, N.Y.

Humidifiers for Convector Radiators



Designed for modern cabinet type hot water and steam convector radiators, automatic humidifiers are available in both two and four trough units in ten different sizes, with evaporating capacities up to 5 gal per day, the manufacturer reports. Copper water troughs, which hold the evaporator pads, are spaced to allow flow of heated air between the pads with little air restriction, according to the company. Maid-O'-Mist, Inc., 3217 N. Pulaski Rd., Chicago 41.

Thermostat



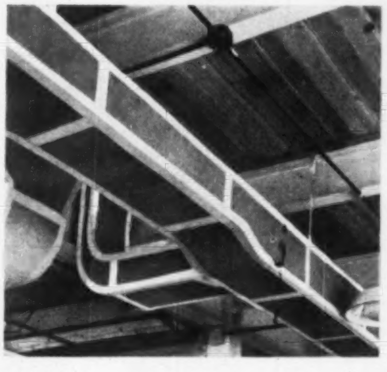
A thermostat, designed exclusively for electric resistance heating, utilizes a hydraulic action element and features a cup and diaphragm directly exposed to the air and to the radiant effects of panel heat, its manufacturer reports. It is designed to maintain a balance between air temperature and surface temperature, allowing one to drop as the other rises. Sunwarm, Inc., Kingsport, Tenn.

COSTS MORE *and* WORTH IT!

Grant Wilson

DUX-SULATION

ASBESTOS PROTECTED



Despite the advent of many lower priced insulations, many of the nation's leading architects and engineers continue to specify Grant Wilson Dux-Sulation. One reason is that Dux-Sulation is just about indestructible — can't possibly be crushed or cracked. Its insulation and sound absorption efficiency, high to start with, *cannot* be impaired during installation.

Dux-Sulation can't powder, shift or sift. There are no "thin" spots, even at corners. There is no deterioration of any kind, no change of any kind. Insulating values are constant, indefinitely!

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write for
Bulletin 567H

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ALADDIN

Centrifugal

ROOF VENTILATORS

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- SELF CONTAINED
- QUIET OPERATING

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PFMA

ALADDIN Centrifugal Roof Ventilators are furnished in thirteen sizes . . . direct and belt driven. Ruggedly built, these units have been designed especially for those installations where positive year around powered ventilation is required.

ALADDIN Roof Ventilators are described in the first complete engineering bulletin yet published on similar units. This bulletin contains full performance tables, characteristic curves and other data required for the proper selection of such equipment.

WRITE FOR BULLETIN 410

ALADDIN HEATING CORPORATION
1111 WEST AVENUE 137 • SAN LEANDRO, CALIF.
REPRESENTATIVES IN ALL PRINCIPAL CITIES IN THE WEST

NEW WEINMAN
type AC centrifugal pump
for air conditioning systems

When outside atmospheres are laden with abrasive dust particles, recirculation of cooling water in air conditioning systems using cooling towers becomes a major maintenance headache. Shaft seals become worn far more quickly than normal and leakage occurs.

The Type AC pump was designed specifically by Weinman engineers to render long service under these conditions; in addition to a rotary type mechanical shaft seal, there is provided a reversible ceramic floating seat and carbon washer combination held by a stainless steel spring, insuring longer life and leakproof operation. The shaft is solid stainless steel, preventing rust or corrosion even when cooling water is chemically polluted.

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MOUNTS IN ANY POSITION TO FIT REQUIREMENTS

Wherever thoroughly dependable, trouble-free circulation of hot or chilled water, pressure-boosting, or other general pumping needs are indicated, Weinman Type AC pumps will give superior service. If you have a pump problem, call your nearest WEINMAN Centrifugal Pump Specialist or write for Bulletin 725 . . . perhaps the Type AC pump is exactly what you need!

Representatives in principal cities.

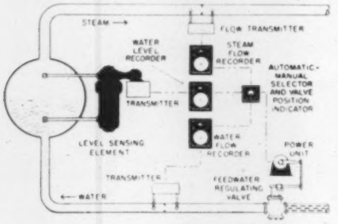
Built by Centrifugal Specialists
The WEINMAN Pump Mfg. Co.
286 SPRUCE STREET • COLUMBUS 8, OHIO

EQUIPMENT DEVELOPMENTS

Continued

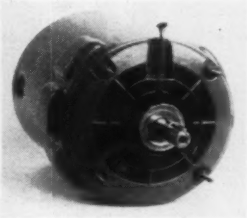
Feedwater Control Systems

Three element feedwater control systems provide speed of transmission, high accuracy of control and are independent of effects due to normal variations in voltage and frequency, according to the manufacturer. The systems are offered to meet the requirements of various sized boilers. Present instruments can be utilized and pressures up to 2500 psig can be accommodated, says the company. Hays Corp., 800 E. 8th St., Michigan City, Ind.



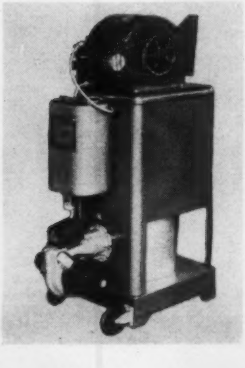
Shaft Mounted Motor

A small, lightweight, totally enclosed fractional horsepower motor for shaft mounted fans and blowers has extended through-bolts which provide a solid mounting face beyond the surface of the end shield, the manufacturer states. The motor is designed for service under conditions of dust and dirt. Filtered oil keeps the bearing surfaces clean in the all-angle sleeve bearings and an extended oiler on the shaft end lengthens service regardless of mounting position, the company says.



Designed for applications having moderate thrust, the motor is available in one- and two-speed single phase models, and in single-speed polyphase models, with ratings up to ½ hp. Ball bearings are available for heavy thrust applications. General Electric Co., Schenectady 5, N.Y.

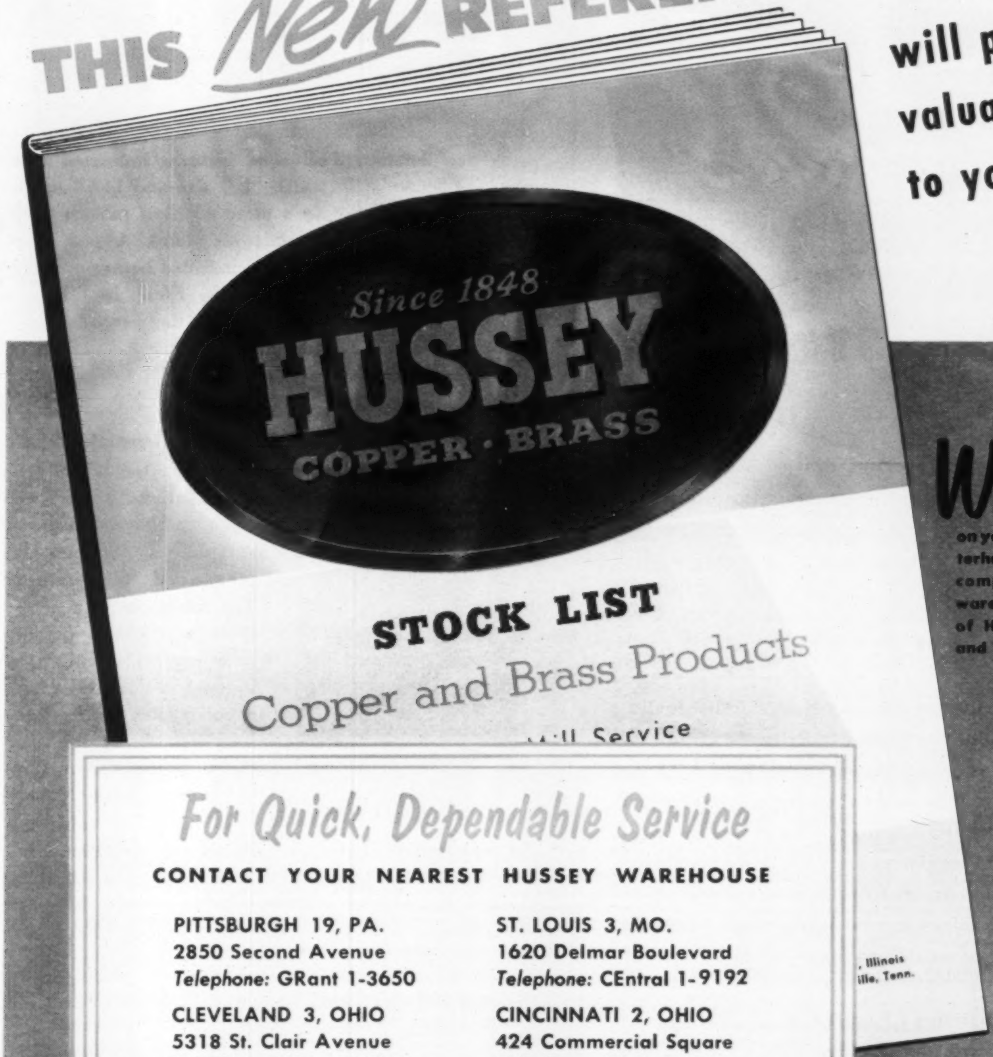
Heating and Cooling Unit



Simplified controls and an attachment, designed to convert the portable heater into a summer cooling unit, are features cited by the manufacturer of the model "PW-189" shown. Conversion of the heater into a fan is done by changing the top blower mounting. As a fan, the unit delivers 1500 cfm of cooled air, the manufacturer reports. Fageol Heat Machine Co., 5725 Mt. Elliott Ave., Detroit 11.

THIS *New* REFERENCE BOOK

will prove valuable to you . . .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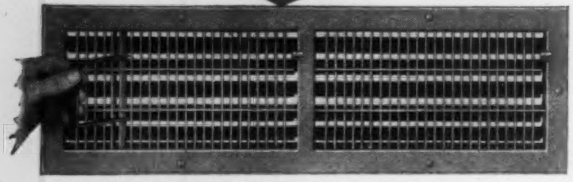

No. 321-A HMV Tandem

Each front grille bar may be adjusted individually. As a result, the angles of deflection or combinations of grille bar adjustment are unlimited. These adjustments may be made when register is installed or at any later time desired. The valves in Independent HMV registers are readily set by a lever control located on the front to direct the air up or down, or the valves may be fully closed. Available in a number of small and large sizes.

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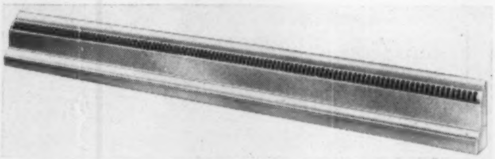
EQUIPMENT DEVELOPMENTS

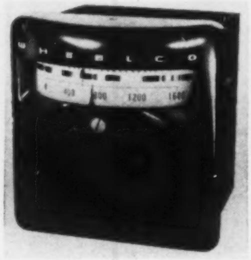
Continued

Baseboard Diffuser



A new baseboard diffuser features increased free areas of 29.36 sq in. on the 4 ft size and 14.68 sq in. on the 2 ft size to give a more efficient pattern with less resistance, its manufacturer states. A new base design permits diffusers to be installed before or after plastering on sub-or finish floor. Front face is removable at any stage of installation, the company says. Knockout strips are designed to speed installation to fittings. Air Control Products, Inc., Coopersville, Mich.

Fuel and Temperature Instrumentation



A highly sensitive, self-contained "Capacitrol" is designed for use in the control of continuous fuel fired process applications which require a proportional relationship between fuel input and a continuously measured temperature. The model 405 incorporates a modified bridge type control circuit. An integral polarized relay, a component of the feed back circuit, is used as the actuator for a fuel valve power unit. Unbalance causes the valve operator to move in a direction to restore the temperature toward the set point and again bring the electrical bridge into balance, the manufacturer states. Wheelco Instruments Div., Barber-Colman Co., 1228 Rock St., Rockford, Ill.

Solenoid Valves

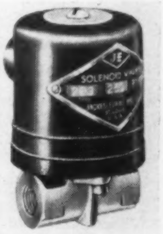
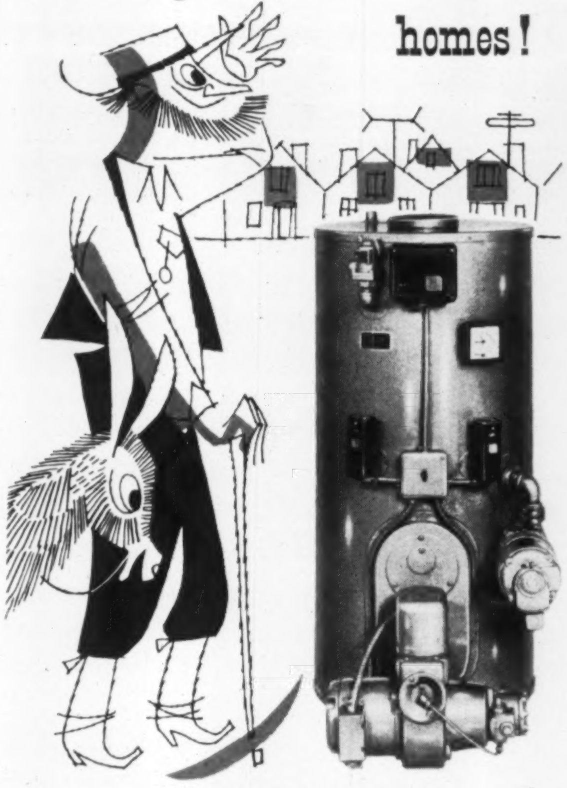


Illustration shows a pilot operated solenoid valve now available in 30 different models for all size line connections from 1/4 to 1 1/2 in., the manufacturer reports. A feature is the use of the same coil assembly on all numbers to simplify service problems and reduce replacement parts inventory. Designed for use with "Freon" 12 and 22, water, air, gas, brine, ammonia, oil, etc. the valve has a synthetic rubber (nylon reinforced) diaphragm that is rugged and durable and unaffected by most flow materials, the company says. Units are available for a-c or d-c operation and have maximum differential pressure rating of 250 psi. Controls Div., Jackes-Evans Mfg. Co., 4427A Geraldine, St. Louis 15.

thar's gold in them thar homes!



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(OIL OR GAS FIRED)

The big prospects today are the small homes. Stake out your claim on this profitable market with the Aldrich Gulf Stream Boiler-Burner line, developed specifically to heat today's small home. The Gulf Stream is manufactured in 5 sizes; the right unit *fits* each home for fuel economy, and *fits* in less space!

Aldrich Gulf Streams provide net ratings from 74,000 to 189,000 BTU per hour. Diameters 22″ to 25″, heights from 44⅛″ to 61½″ mean handling ease in installation, added space-savings in basement or utility room. There's plenty of hot water, up to 255 GPH, when tankless coil is included.

All Aldrich Gulf Stream models are available in "Standard" or "Package". The convenient "Package" unit is pre-wired, accessory equipped, ready to set in place and connect.

For a bigger share of today's big market, feature the Aldrich line — first with builders and buyers!

HOT WATER HEATERS — Internally galvanized, high delivery direct heating, no slow storage. SERIES "B"— 93 to 850 GPH at 100°F. rise. SERIES "C"— 100 to 255 GPH at 100°F. rise.

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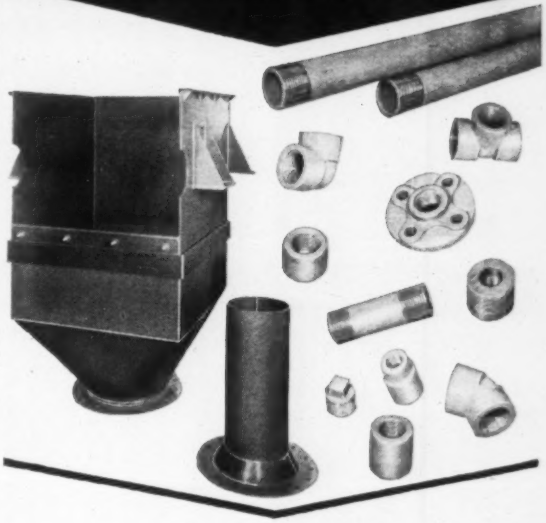
PLASTIC PIPE, FITTINGS AND FABRICATIONS



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A rigid non-plasticized polyvinyl chloride, Van-Cor is fabricated into such products as: Ducts, Hoods, Chemical Tanks, Tank Liners, Plating Racks, Fume Stacks and Piping.

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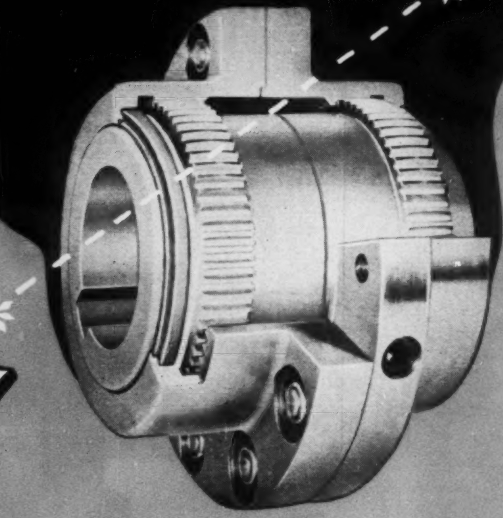
COUPLINGS



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1 **ALL STEEL** construction from high grade steel forgings with fine tool finished surfaces.

2 **ONE PIECE COVER SLEEVE** is one solid forged steel unit for added safety at high speeds.

3 **AUTOMATIC LUBRICATION** with ever-present oil film between hub and sleeve to prevent friction or wear.

4 **POSITIVE SEAL** hermetically seals coupling against oil oxidation and keeps ample supply of CLEAN oil inside.

5 **LONGER LINING UP SURFACE** insures easy, accurate initial alignment and full capacity to handle any subsequent misalignments.

6 **COVER SLEEVE BEARING** prevents any added pressure to either shaft; eliminates adverse end crank action on shaft.

7 **LARGER BORE** permits use of smaller physical capacity for same size shaft and reduces rotating weight.

WALDRON couplings are available in sizes up to 18" shaft diameter. We specialize in furnishing couplings for unusual applications and services. We would be pleased to send you our latest bulletin 55-H upon request.

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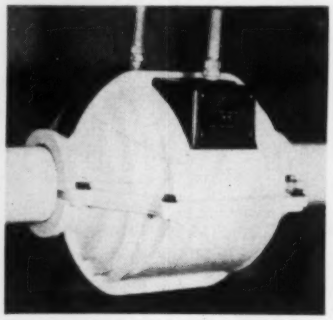
Magnetic Meter



An electromagnetic flow meter, designed for 2 to 8 in. flow lines, will measure the volume flow rate of any liquid of sufficient conductance and velocity and is unaffected by the pressure, viscosity, density or changes in conductivity of the flowing liquid, its manufacturer states.

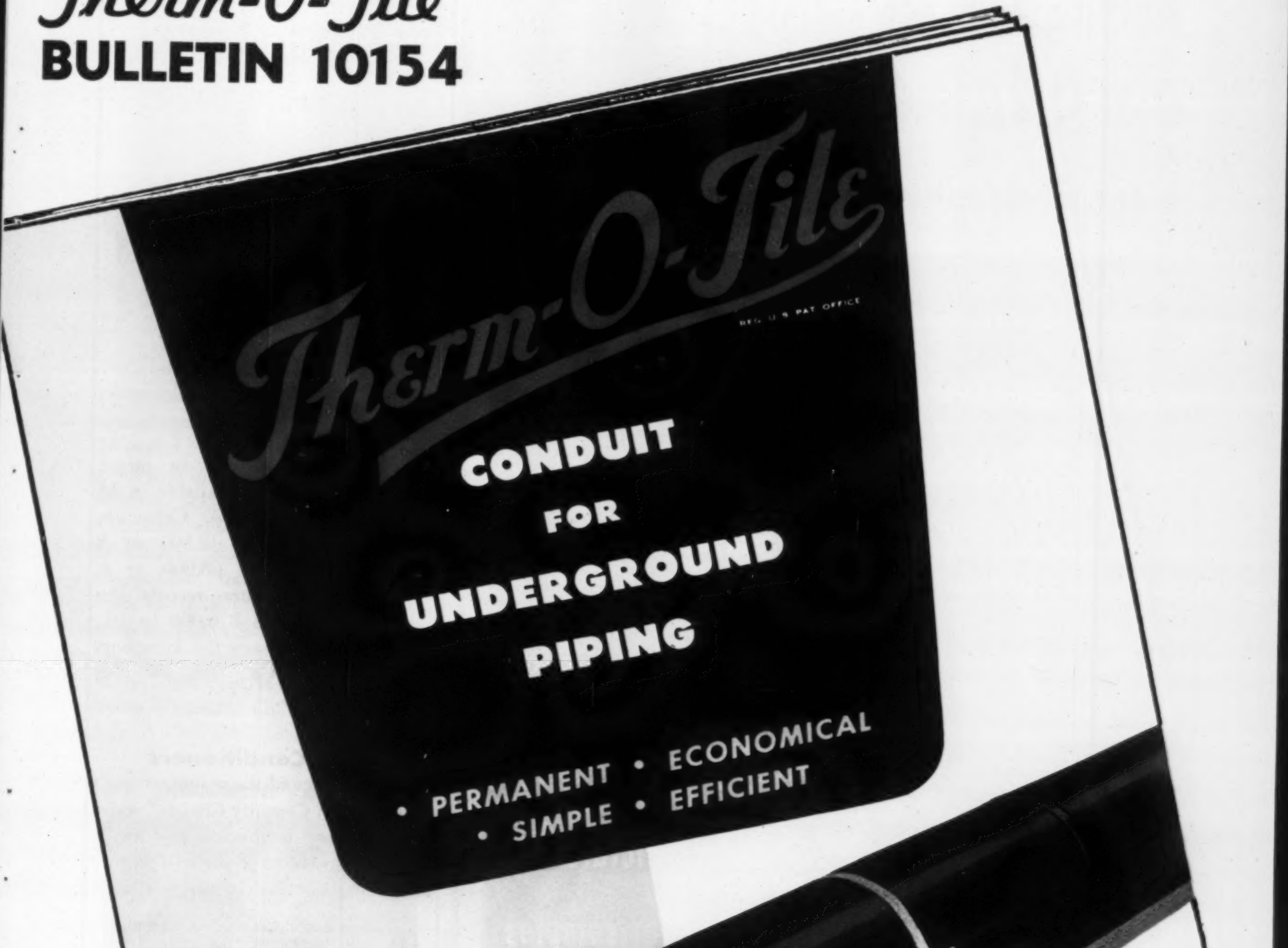
The unit consists of a nonmagnetic flow tube with an insulating liner containing flush mounted electrodes and surrounded by an a-c electromagnet. When conductive liquid passes through the tube, an alternating voltage is set up between the electrodes which varies linearly in producing a chart record in appro- wires from the electrodes transmit this voltage output to a recorder, producing a chart record in appropriate units of flow. The Foxboro Co., 106 Neponset Ave., Foxboro, Mass.

Venting Valve

No. 33
VENT-RITE

The manufacturer's No. 33 "Vent-Rite" venting valve has a 1/4 in. pipe thread male connection. Constructed of rust- and corrosion-resistant materials, it has a thermofloat designed to insure positive closing and opening and to act as a seal against water. This valve is a supplement to the No. 37, which has a female connection. Anderson Products, Inc., 17 Tudor St., Cambridge 39, Mass.

New! ASK FOR A COPY!
Therm-O-Tile
BULLETIN 10154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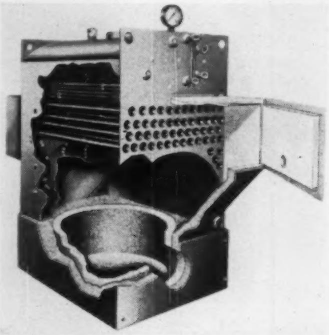
EQUIPMENT DEVELOPMENTS

Continued

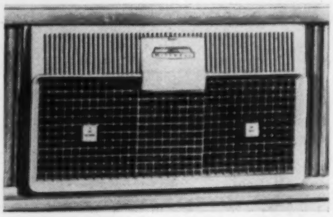
Low Waterline Boiler

A firebox construction, low waterline boiler, the manufacturer's "LWL" series, is designed for steam and hot water systems in larger structures. Units are available in 16 sizes, oil or gas fired. Capacities range from 3650 to 42,500 sq ft steam and 5840 to 68,000 sq ft water, the manufacturer reports. Btu output ranges from 876,000 to 10,200,000 per hr, says the company. Portmar Boiler Co., Inc., 193 7th St., Brooklyn 15.



Room Air Conditioners

Shown is one of the manufacturer's "Super High Capacity Chassis" series of room air conditioners said to be capable of cooling a room in 5 min and being installed in still less time.



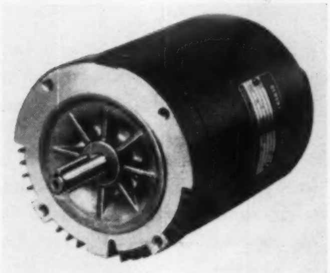
Available in ¾, 1 and 1½ hp models, they feature "Air Flow Modulation," a regulating switch that enables the unit to deliver either a concentrated column of air for fast cooling, or a gentler flow to maintain desired temperature, the company says.

The allied "Bel-Air" series features louvered panels adjustable to 20 different directions, and "Expandomount," which permits the units to be moved from room to room. This series is available in 1/3, ½, ¾ and 1 hp models. Mitchell Mfg. Co., 2525 Clybourn Ave., Chicago.

EQUIPMENT DEVELOPMENTS

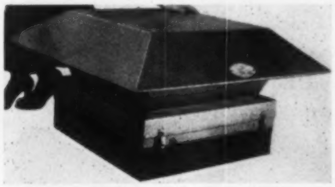
Continued

End Mounted FHP Motors



An end mounted fractional horsepower motor is equipped with a special grease designed to facilitate increased bearing life. The grease gives long lubrication with little maintenance, according to the company engineers, and aids the ball bearings to absorb heavy end thrust load easily. The motor is available in open and totally enclosed, fan cooled models, NEMA size 56C face mounting. Both models come in ratings of 1/4, 1725 rpm, to 1 hp, 3450 rpm. General Electric Co., Schenectady 5, N.Y.

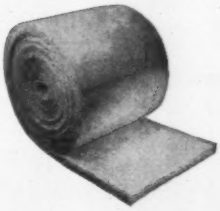
Low Silhouette Ventilator



The low silhouette of the manufacturer's "Lo-Sil Vent" is designed to afford beauty while maintaining operating efficiency, the company states. For installation in schools, hospitals, commercial buildings, etc., the unit is available in 31 capacity sizes from 225 to 17,600 cfm, with static pressures to 5/8 in., according to the manufacturer. The model is mounted on special vibration separators. Muckle Mfg. Co., Owatonna 3, Minn.

Air Conditioner

A new air conditioning unit which can be adjusted to fit flush with the inside wall, is featured in the manufacturer's 1955 line of room air con-



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ULTRALITE Duct Insulation and Duct Liner are the only flexible glass fiber duct insulations with a 6-year record of performance. A few feet of ULTRALITE Duct Liner reduces equipment noise to a whisper. Vapor-barrier faced ULTRALITE prevents condensation. Both can be fastened in place with adhesives or other simple means. Thermal and acoustical efficiency is higher ....applied costs are lower!

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Thermal and acoustical glass fiber insulations • Pipe Couplings and fittings
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USE THIS TORCH-O-MATIC

USE ACETYLENE?
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Whichever Torch-o-matic you use —exclusive trigger-control saves you time, saves you fuel

With either the Propane or Acetylene Torch-o-matic, you get the *exclusive trigger-control* feature that saves time, saves gas, adds safety to every job.

The instant you pull the trigger, the flame lights, and you're ready to go to work. No matches, no adjusting, no time wasted. Release the trigger and the flame shuts off. And with the Propane Torch-o-matic, a special two-stage valve lets you increase the flame from a pinpoint to a full 6 inches in length simply by pulling the trigger completely back.

Add it up and you can quickly see how the AUTOMATIC ON-OFF trigger-control puts you ahead when you're using Torch-o-matic, saves you gas when you're not.

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VELOCITY POWER TOOL CO.
201 North Braddock Avenue
Pittsburgh 8, Pa.

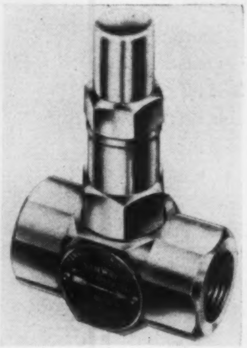
EQUIPMENT DEVELOPMENTS

Continued

ditioners. These units are said to be very quiet in operation. The flush mount construction, known as "Drape-Line" design, is available in ½ hp, 115 volt and ¾ hp, 115, 208 and 230 volt models and in 1 hp, 208 and 230 volt models. Cooling capacity is not lowered by the flush position, according to the manufacturer.

The "All-weather" units, which heat as well as cool, are available in ¾ and 1 hp 230 volt models. A reverse flow of refrigerant extracts heat from the outside air to provide heating. General Electric Co., Major Appliance Div., Louisville.

Impulse Steam Trap

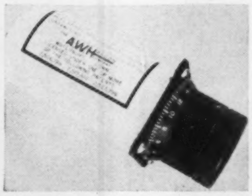


A ½ in. impulse steam trap, the manufacturer's model "20-A," is designed with low capacity to handle light condensate loads. The trap will not freeze or air bind on steam tracer line service, the company states. Made of stainless steel, the units accommodate pressures to 400 psi. Yarnall-Waring Co., 100 Mermaid Ave., Philadelphia 18.

Stainless Steel Valve

The manufacturer's bulletin 8265 stainless steel valves are designed to control gases and liquids generally corrosive to bronze, steel, or iron, at pressures to 250 psi. They are normally closed (closed when de-energized, open when energized) valves. Continuous duty class "A" coils for temperatures to 212 F are provided. Class "H" coils are supplied for temperatures to 450 F. Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.

Time Delay Relay



A line of time delay relays are motor driven and designed to provide accurately controlled time delay periods adjustable over a wide range, their manufacturer reports. One model, adjustable from 2-30 seconds, is calibrated in two-tenth second increments. Calibrations are on the

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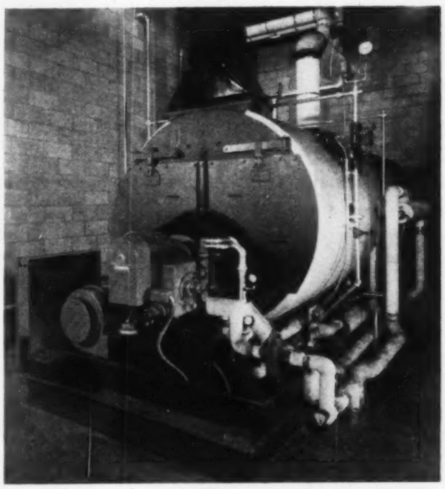

3000 Series Package Boiler Installation
Sears, Roebuck Co., Buffalo, N. Y.

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FOR HEAT and POWER

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Locomotive Type Boilers
Bison Two-Pass Refractory Lined Boilers
Scotch Marine Boilers
Scotch Dry Back Power Boilers
Utility Scotch Boilers
Bison Compact Boilers
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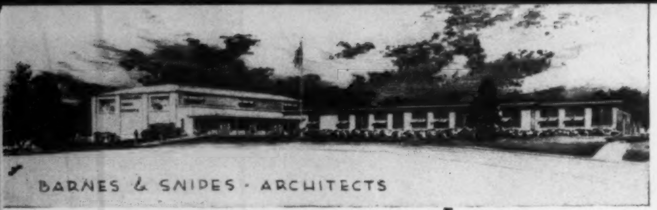
ASME — API-ASME — LLOYDS
QUALITY BOILERS TO GIVE QUALITY SERVICE



Heating Installation by Hausgas, Inc., Washington, Mo.

"Janitrol gas unit heaters helped us build within our budget"

. . . Statement by Mr. James Dawson, Supt. of Schools, Crawford County, Bourbon, Missouri.

"By using Janitrol Gas Unit Heaters instead of a central heating system, we saved enough to build within our budget. Installed in September, the 17 Janitrol Unit Heaters have proved highly satisfactory!", said Mr. Dawson.

The teachers, too, are very happy with this heating system. Each room being thermostatically controlled, each teacher can maintain any desired temperature.

Why not consider the *practical money-saving advantages* of Janitrol Unit Heaters for your requirements . . . whether for a new plant, a remodelled building or to replace an obsolete heating system that is costly to maintain and operate?

Bruce F. Barnes, of the firm of Barnes and Snipes, architects, writes, "The reasons for considering your equipment included economy of installation and flexibility of handling the heating problem. Savings over other equipment approximate over 50%."

Janitrol
GAS-FIRED UNIT HEATERS

Write today for your copy of Businessman's Blue Book of Better Heating. It gives numerous examples of correct unit heater installation practices for many types of buildings.

Janitrol Division of
SURFACE COMBUSTION CORP.
Columbus 16, Ohio
In Canada: Alvar Simpson Ltd., Toronto 13, Canada

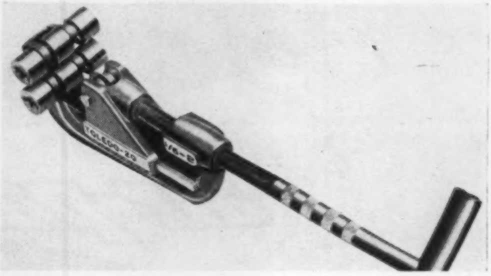
ALSO MAKERS OF
Surface INDUSTRIAL FURNACES **Kathabar** HUMIDITY CONDITIONING

EQUIPMENT DEVELOPMENTS

Continued

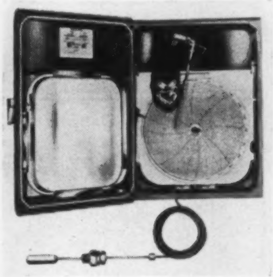
perimeter of the dial. The unit weighs about $1\frac{1}{4}$ lb. A. W. Haydon Co., Waterbury, Conn.

Six Roller Pipe Cutter



A heavy duty, six roller pipe cutter is designed to prevent spiraling when used with power drives, the company states. Its capacity is $\frac{1}{8}$ to 2 in. pipe. The unit's high alloy steel cutter wheels leave very little burr, according to the manufacturer. A single cutter wheel is in the sliding block. Toledo Pipe Threading Machine Co., 1445 Summit St., Toledo 4.

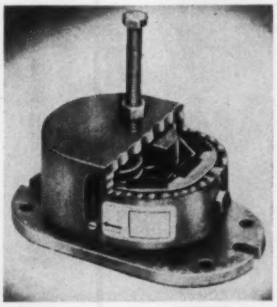
Thermometers With Linear Scale

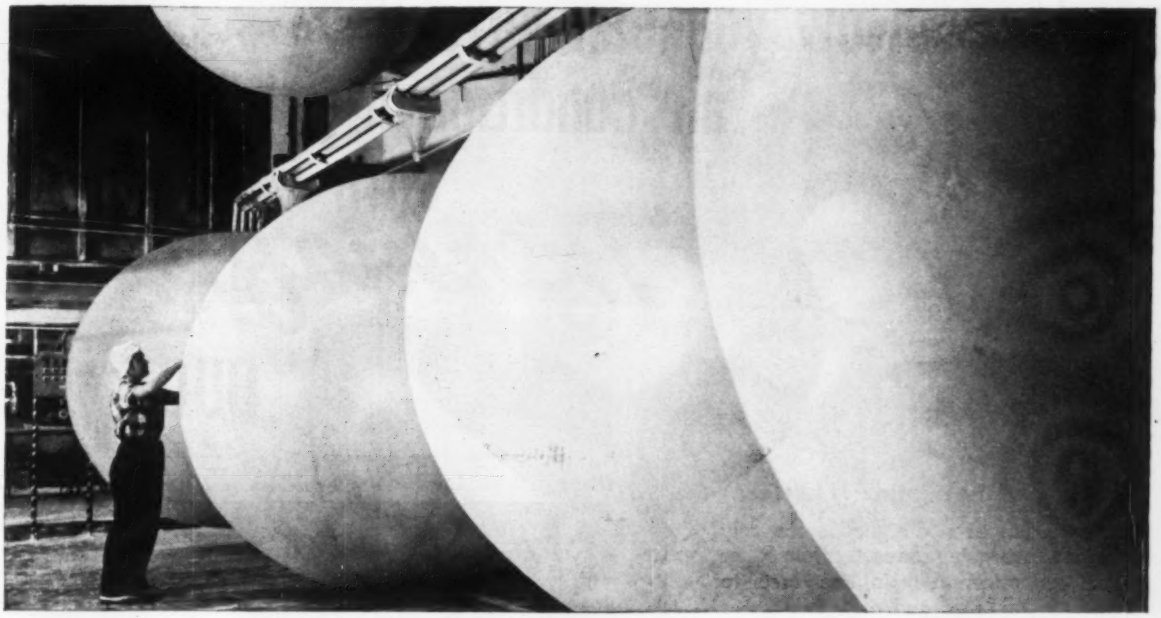


New vapor pressure actuated thermometer systems are designed to record on uniform charts instead of the expanded charts previously used. A "Varying-Ratio" linkage converts the nonlinear vapor pressure-temperature curve into a linear deflection of the recording pen. The linkage is available for all ranges from −20 to 600 F, the company reports. The Bristol Co., P.O. Box 1790, Waterbury 20, Conn.

Spring Type Vibration Isolating Unit

Type "SE," spring type isolating unit, is of telescopic construction, fully enclosed in a semisteel housing. The steel spring mounting, with chrome vanadium springs, permits the deflections necessary for isolation efficiency, the manufacturer states. While the unit is fully enclosed for protection against oil, wastes, etc., inspection windows permit checking of adjustment and operation, says the company. Vibration Mountings, Inc., 76-19 Queens Blvd., Elmhurst 73, Long Island.





WEATHER BALLOON MAKER SAVES $2500 A YEAR WITH KATHABAR EQUIPMENT

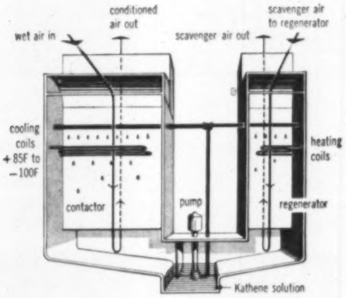
Kathabar humidity conditioning provides the right weather for making weather balloons. The Dewey and Almy Chemical Company obtains 40-grain air without frost, expensive over-cooling and re-heating, or duplicate coils. The system's coolant is 75°F water. *Results:* annual saving of $2500 in operating costs—and faster production of their balloons.

Here's how their two-zone system works. In the first zone, ground level, latex balloon gels are inflated from one-fourth to full size. Moisture between latex particles is a necessary lubricant during gel inflation. The maintained air conditions average 70°F, 50% RH.

Second zone, an 80-foot drying tower, is held at 100°F and 20-30% RH for final drying. The moisture must be removed at a controlled rate—not too fast or the balloons rupture; not too slow or production is impeded. Temperatures over 100°F would cause a spotty pre-cure.

This is a typical example of how Kathabar humidity conditioning has solved industrial air conditioning problems for 20 years. Your Kathabar system representative can show you how to dictate *your* production weather. As a trial balloon, write for Literature Group K54-2.

WHAT COULD BE SIMPLER?



Air to be conditioned passes through the contactor, where an absorbent solution removes moisture (the amount depends on the automatically-controlled temperature of the solution). In the automatic regeneration, about 15% of the solution is heated, and the moisture it releases is blown out the window.

Kathabar®
HUMIDITY CONDITIONING

SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

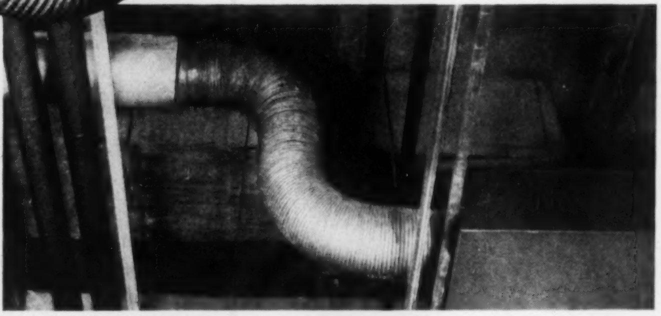
ALSO MAKERS OF **Surface** INDUSTRIAL FURNACES **Janitrol** AUTOMATIC SPACE HEATING

Now you can save 25%—32% on air conditioning installations with *Thermaflex*:® DUCT

Here's why Thermaflex is better:

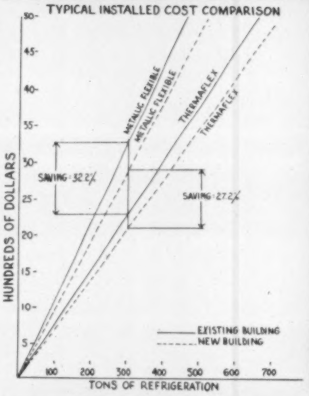
Thermaflex has been designed exclusively for use as a cost-saving connector from either vertical or horizontal main line ducts to diffusers, sound boxes, and/or other types of distributors in both high- and low-pressure air conditioning systems.

1. **Light in Weight**—Thermaflex is exceptionally light in weight . . . easy to handle.
2. **Maximum Flexibility** — Thermaflex snakes around obstructions . . . takes close bends with a radius equal to half its own diameter. Eliminates misalignment problems between main line and sound box or diffuser.
3. **Easy to Install** — No special skill or training needed for the installation of Thermaflex. Lengths can be easily carried up ladders and cut to size using only a pocketknife and diagonal side cutters. No special fittings required . . . slips easily in place for airtight service.
4. **Flameproof — Waterproof** — Due to the unique construction of Thermaflex, it is highly flame resistant, will not support combustion, and is completely impervious to the effects of moisture, rust, rot, fungus and mildew.
5. **Reduces Vibration — Deadens Noise** — Thermaflex reduces mechanical noises in the line due to vibration. Its unique acoustical features also dampen air-stream noises. This is particularly important for low-pressure systems where connections are made directly from main line to diffuser.
6. **Excellent Air Flow Characteristics** — Thermaflex has excellent air flow characteristics with minimum friction loss in bends.
7. **Adaptability** — Thermaflex is available in a wide variety of diameters, 3" to 12", in standard 12 foot lengths.



Thermaflex bends easily to fit any installation

HERE'S PROOF



TYPICAL
INSTALLED COST
COMPARISON

1000 TONS NEW BLDG.	COST	SAVINGS	
RIGID METAL	8,960.00		
		7½%	30%
METALLIC FLEXIBLE	8,300.00		
		25%	
THERMAFLEX	6,225.00		

THERE'S AN AGENT NEAR YOU

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Visit our booth #C-156 at the International Heating & Ventilating Exposition, Commercial Museum & Convention Hall Philadelphia, Pa. January 24 to 28, 1955

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Howard V. Caton Company
Post Office Box 4126 (1425 Elizabeth Avenue)
Charlotte, North Carolina

The Robert B. Darling Company
207 East 37th Street
New York 16, New York

Jack Thomas Davis
Room 211, 3303 Montrose Boulevard
Houston 6, Texas

Graves Refrigeration, Inc.
254 Boulevard, N. E.
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Heaven Engineering Company
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Kansas City 8, Missouri

Hyland Engineering Sales
623 Architects & Builders Building
Indianapolis 4, Indiana

The Leonhardt Company
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J. C. Lewis Company
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Syracuse General Sales Company
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Ward & Black Engineering Sales
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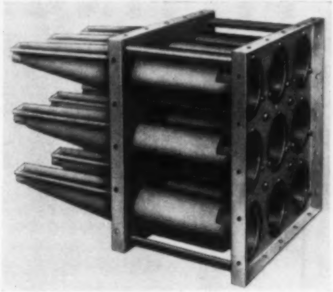
Pittsburgh 33, Pennsylvania

F. B. Wright Company
1565 Oakman Boulevard
Detroit, Michigan

Norman S. Wright & Company
2779 Folsom Street
San Francisco 10, California

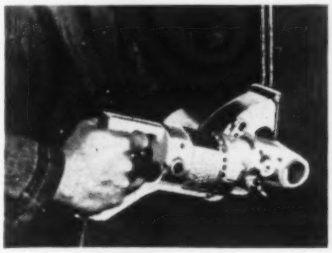
George V. Zintel Company
840 North Michigan Avenue
Chicago 11, Illinois

Granular Dust Collector



An outside-in twist that reverses the tangential flow of most centrifugal dust collectors is designed to give the manufacturer's dry granular dust collector efficiency over a wide range of volumes. A conical inlet imparts a swirling motion to dust particles, permitting clean air to travel through the tube without changing direction, the company reports. Nine tubes are combined to form a standard modular cell, as is shown here. American Air Filter Co., Inc., 373 Central Ave., Louisville 8.

Plaster Cutter

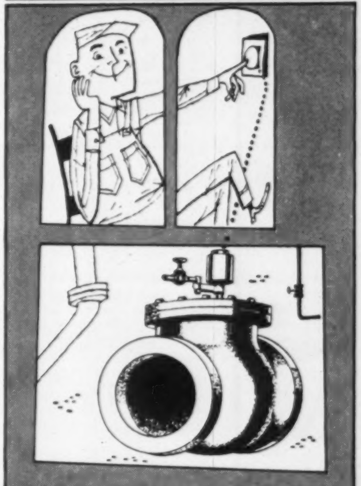


A newly designed portable electric plaster cutter consists of: the case, which houses a motor operating on a-c or d-c current; two 4 × 5/32 × ½ in. abrasive wheels with guard, equipped with support handle; the handle to which is attached a trigger switch and 15 ft of cord with plug-in for any outlet. The entire unit is 16½ in. in length and weighs 13 lb, the manufacturer reports. Wodack Electric Tool Corp., 4627 W. Huron St., Chicago.

Filter Unit for Gas

A filter unit designed to remove liquid or solid particles contaminat-

modernize
YOUR PLANT WITH
G-A
SOLENOID
VALVES
WHICH CAN BE
OPERATED
LIKE THIS



✓ or by many other types of electrical impulse
✓ Use the angle body and save the price of an elbow fitting
✓ Positive Control
✓ Sizes ½" thru 36"
✓ Used on Water, Oil, Air and Many Other Liquids

BULLETIN W-7 HAS THE TECHNICAL FACTS
WRITE FOR IT TODAY

GOLDEN ANDERSON
Valve Specialty Company
1210 RIDGE AVE., PITTSBURGH 33, PA.
Designers and Manufacturers of
VALVES FOR AUTOMATION

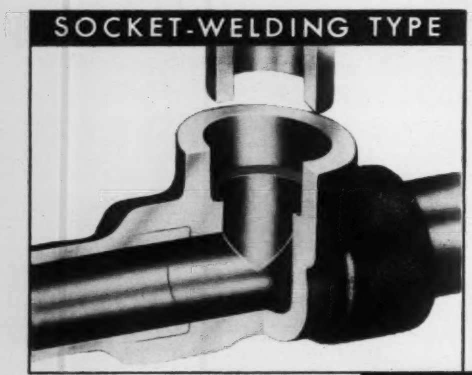
WATSON-STILLMAN

FORGED STEEL PIPE FITTINGS

Drop Forged for resistance to pressure, heat, corrosion, shock and vibration.

Screw-End and Socket-Welding types in carbon, stainless and alloy steels.

SOCKET-WELDING TYPE



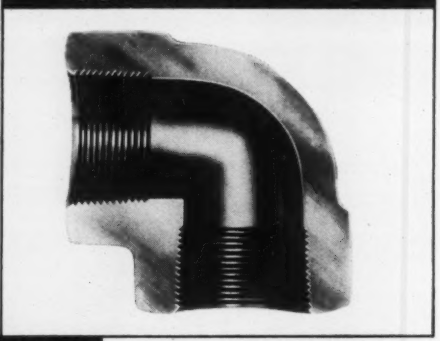
EASY TO INSTALL Just slip fitting over end of pipe and weld. Deep sockets support and align the pipe. Eliminate tack welding or special fixtures.

CLEAN WELD Outside-the-pipe fillet weld prevents welding icicles inside pipe.

SMOOTH FLOW Inside diameter of fitting matches inside diameter of pipe for smooth flow.

Complete line available for Schedule 40, 80, 160 and double-extra heavy pipe. Sizes 1/8" to 4" IPS in carbon steel; 1/8" to 2" IPS in stainless and alloy steels.

SCREW-END TYPE



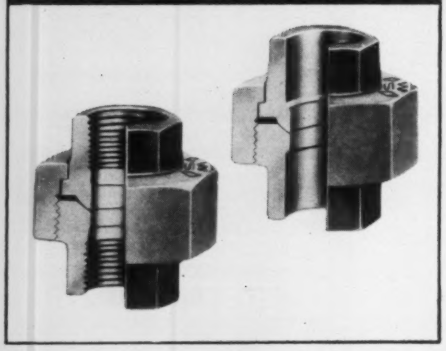
LONG, ACCURATELY CUT THREADS To insure perfect alignment and tight joints.

LONG BANDS Extend well beyond the last thread for extra reinforcement.

UNRESTRICTED FLOW Provided by passages greater in area than pipe of equivalent size.

Complete line available in 2,000, 3,000 and 6,000 lb. class. Sizes 1/8" to 4" IPS in carbon steel; 1/8" to 2" IPS in stainless and alloy steels.

FORGED STEEL UNIONS



SCREW-END and SOCKET WELDING TYPES, 3000 lb. class. Sizes 1/8" to 2"

- AAR DESIGN— ASTM 105 Grade 2
- STEEL-to-STEEL SEAT with ball-to-angle mating surfaces
- Cadmium plated nuts to resist galling and seizing

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Bulletin U-1 — Forged Steel Unions
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Sold Through Leading Distributors

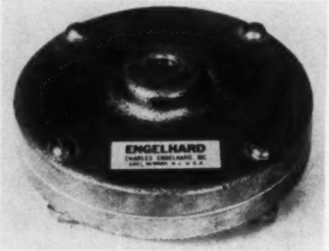
WATSON-STILLMAN FITTINGS DIVISION

HKP **H. K. PORTER COMPANY, INC.**
Roselle, N. J.

EQUIPMENT DEVELOPMENTS

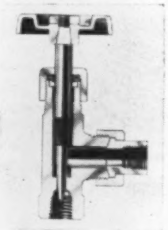
Continued

ing a gas has a low back pressure, demonstrated by its ability to extract all traces of cigarette smoke, says the manufacturer. The standard filter is unaffected by temperatures up to 300 F, while a high temperature filter is available to withstand 1200 F. Charles Engelhard, Inc., 850 Passaic Ave., East Newark, N. J.

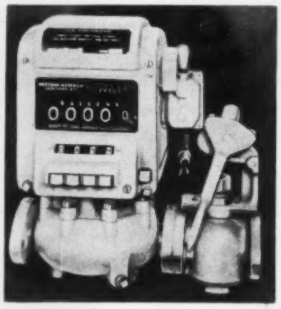


Needle Valves

Forged needle valves with universal outlets, featuring micrometer thread stainless steel stems for metering, have a wide range of optional mountings to facilitate their use in a variety of installations, according to the manufacturer. Carpenter Valve Corp., 6723 Denison Ave., Cleveland.



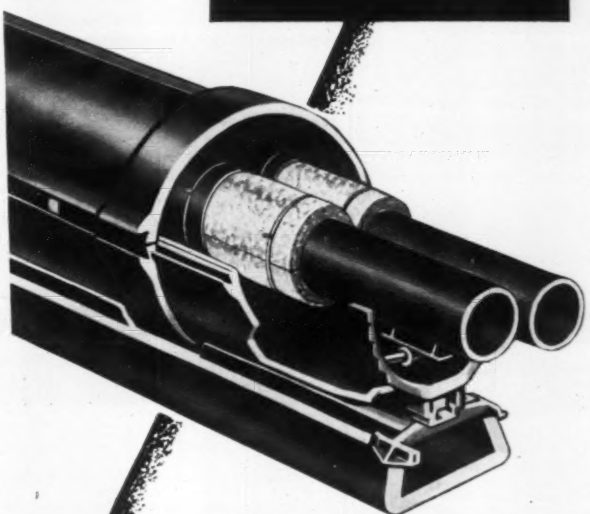
Automatic Liquid Meter



A new liquid meter features a built-in, explosion-proof electrical switch which is actuated automatically when a desired quantity of liquid has passed through the meter, the manufacturer reports. The switch

Two Reasons Why

Universal Vitrified Tile Conduit



offers you the greatest protection for underground insulated piping . . .

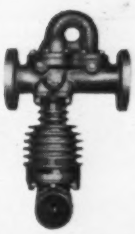
① Made of hard surface salt-glazed vitrified clay — impervious to disintegrating action of electrolysis, water, acids, alkalies, rust, etc.

② The special Universal feature — interlocking construction and continuous Key-Lock side joints — assure a completed assembly of all parts into a rigid, serviceable and water-tight whole.

Easy to Install • *Two Styles* • *Write for Catalog #54*

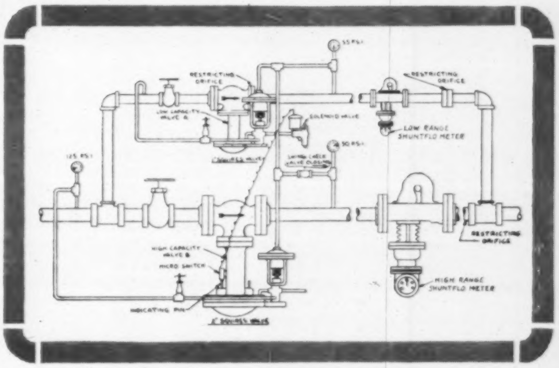
Now sold exclusively by:
MUNDET Cork Corporation Distributors

UNIVERSAL SEWER PIPE CORPORATION
Steam Conduit Division
1500 UNION COMMERCE BLDG. • CLEVELAND 14, OHIO



A New Way to Increase Steam Revenue

Builders now offers a newly developed system for metering both high and low steam flows — Dual Ranging Shuntflo Meters. As shown in the diagram, this system employs a main line Builders Model SMKS Shuntflo for metering normal steam flows. When the flow drops below the effective limit of this meter, two instantly interlocked Squires Pressure Reducing Valves by-pass the flow through a shunt where it is metered by a low capacity Builders SMDH Meter.


55 P.S.I.
RESTRICTING ORIFICE
LOW CAPACITY VALVE A
SOLENOID VALVE
RESTRICTING ORIFICE
LOW RANGE SHUNTFLO METER
50 P.S.I.
125 P.S.I.
SQUIRES VALVE
SWING CHECK VALVE CLOSING
RESTRICTING ORIFICE
HIGH CAPACITY VALVE B
MICRO SWITCH
HIGH RANGE SHUNTFLO METER
INDICATING PIN
2" SQUIRES VALVE

Using this simple system of controls, steam can now be accurately checked over a 80 to 1 flow range, or greater if required. The result: new dollars of steam income for the same amount of steam output. No wonder this development is being watched with such interest by utilities, industries, and district heating companies throughout the country.

You can see Builders Dual Ranging Shuntflo Meters at the Heating and Ventilating Exposition in Philadelphia, from January 24 to 28 . . . at Booth No. C 43. Come in and discuss this money-making meter with us or write for technical reprint REF. No. 100-K29. Builders-Providence, Inc., 381 Harris Avenue, Providence 1, Rhode Island.

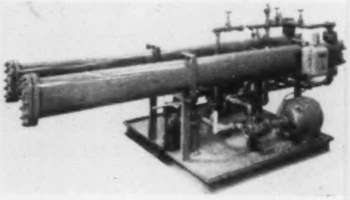
BUILDERS-PROVIDENCE
DIVISION OF B-I-F INDUSTRIES, INC.
METERS FEEDERS CONTROLS

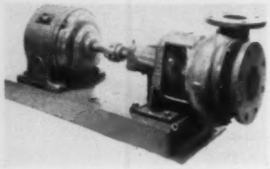
GOT A LIQUID TRANSFER PROBLEM?
USE
EAGAN PUMPS

The Eagan pumps pictured and described below are a tremendous bargain from a performance, construction and price standpoint. They're designed to meet and exceed *your* liquid transfer requirements as they do for users throughout many different industries.

CONDENSATE PUMPS. Capacities to 100,000 sq. ft. EDR at 200 psi. Five types of units have been developed to meet all operational requirements and specifications. They include units with overhead receivers for high temperatures as well as underground receivers for buried returns, steel, cast iron and lined receivers. Centrifugal and turbine pump elements — whichever is best suited for the individual requirement.

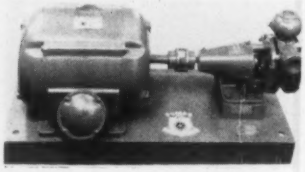
FUEL OIL PUMP AND HEATER SETS for combustion preparation of heavy industrial fuel oil. Packaged units, delivered ready to operate including integral temperature and pressure controls. They heat to 300° F., pump up to 400 psi., have capacities to 3000 gph. are easily installed, serviced. Made in single or duplex models, electric or steam drive or both.

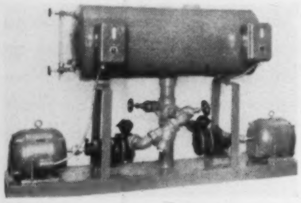




CENTRIFUGAL PUMPS. Heavy duty, two ball bearing construction. Includes valuable service features of renewable shaft sleeve and casing wearing ring. This centrifugal line will handle up to 1100 gpm. and discharge at pressures to 200 ft. Also made in three small sizes with single ball bearings and open impellers.

TURBINE PUMP Made for capacities to 200 gpm. at pressures to 200 psi. in many metals for corrosive chemicals as well as water. Incorporates preloaded bearings to permit positive centering of impeller without lateral bearing play. This permits high speeds without excessive wear.





BOILER FEED PUMPS. Packaged units designed to combine the function of boiler feeding and fresh water make-up. High receiver prevents flushing when traps begin to leak. Made in single and duplex construction for capacities to 100,000 sq. ft. at 200 psi.

WALTER H. EAGAN CO., INC.
Pump Specialists Since 1920
2336 Fairmount Ave., Phila. 30, Pa.

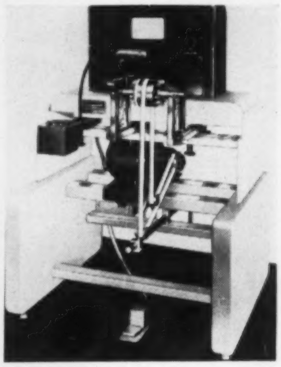
See our exhibit at the show Booth No. 348

Send me literature and information on the pumps I've checked:
☐ Condensate
☐ Fuel Oil Pump & Heater Sets
☐ Centrifugal
☐ Turbine
☐ Boiler Feed

EQUIPMENT DEVELOPMENTS
Continued

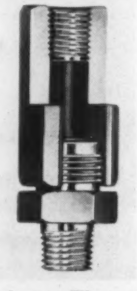
can be used to turn pumps on or off, actuate solenoid valves, start agitators, or control other cycling operations by use of suitable relays, etc., says the company. The "Auto-Switch," as it is called, is available on the manufacturer's type "S" meters in sizes from 1 to 4 in. for rates of flow to 500 gpm. Neptune Meter Co., 19 W. 50th St., New York 20.

Balancing Machines



Shown is one of a series of nine general purpose, static and dynamic balancing machines for small and medium sized rotors. Magnitudes of unbalance are indicated by a meter directly in terms of the unbalance correction procedure selected. Angular positions are pointed out by a stroboscopic lamp, and are readable either as location to remove weight ("heavy" point) or as location to add weight ("light" point), the company states. MacDell Sales Div., Balance Engineering Co., 850 W. Lake St., Chicago 7, Ill.

Check Valve



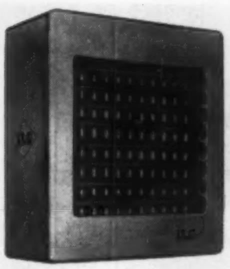
A new check valve designed to provide maximum flow with low opening pressures and bubble tight operation throughout its working range, consists of a two piece metal body and a special composition sleeve. The valve has no seat, spring

EQUIPMENT DEVELOPMENTS

Continued

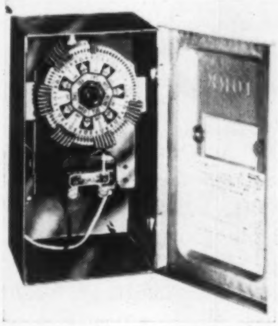
or other moving parts. The sleeve is replaceable if ever damaged, the manufacturer reports. The valve may be mounted in any position and is said to be silent in operation and immune to vibration. Betts Machine Co., 1800 Pennsylvania Ave., W., Warren, Pa.

Steam Unit Heaters



Steam unit heaters designed to meet heating needs in factories, stores and offices are available in 16 horizontal and 12 vertical types. Their manufacturer cites the following as advantages: Side entrance on the horizontal models is designed to provide four different pipe connection arrangements. An improved louver arrangement facilitates efficient heat flow and all models are equipped with specially built, totally enclosed motors to drive the propeller fans. Ilg Electric Ventilating Co., 2850 N. Pulaski Rd., Chicago 41, Ill.

Automatic On-Off Control



A week's scheduling of automatic *on-off* control has been facilitated with the introduction of a new 7 day dial, its manufacturer reports.

BARBER COLMAN

New Wheelco Combustion Safeguard

Manual or automatic control for oil and gas fired burners

FLAMEOTROL

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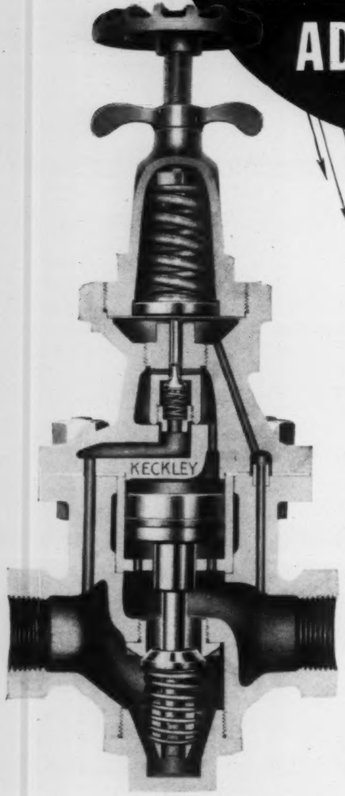

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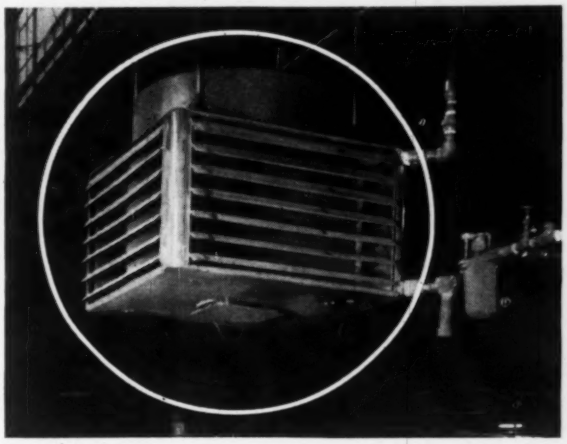

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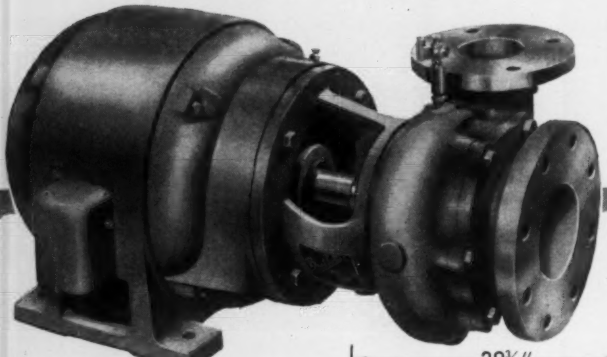

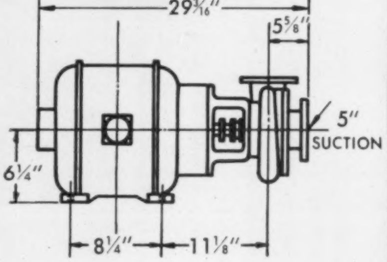

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SMOKE DENSITY METER, the manufacturer's "Smokescope," determines whether or not fuel is being properly burned to gain full Btu advantage, the company states. Mine Safety Appliances Co., Braddock, Thomas and Meade Sts., Pittsburgh 8.

LUBRICANT SEAL for threaded fittings, "Big 'D' Dope," provides lead plating, island high, permitting repeated, quick assembly and disassembly with a single application, its manufacturer reports. C. H. Dragert Co., Inc., Chalk Hill Rd., Dallas.

NEW TYPE THERMOCOUPLE has been developed, featuring rugged construction and fast response. Among the applications are the measurement of temperature changes of metal wall surfaces and air temperatures. Engineering Div., Midwest Research Institute, 4049 Pennsylvania, Kansas City, Mo.

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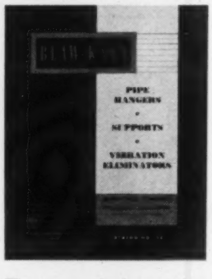

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▶ *ACCESSORIES FOR HOSE AND DUCTWORK*—Accessories for installation of "Flexaust" hose and "Portovent" duct for industrial applications are described in illustrated bulletin No. 41. The Flexaust Co., 100 Park Ave., New York 17.

▶ *AIR CONDITIONERS*—The application and performance characteristics of the manufacturer's four types of "Airditioners" are given in four page bulletin 754 D. Types are: console, concealed, overhead and deluxe ceiling. Modine Mfg. Co., 1509 De Koven Ave., Racine, Wis.

▶ *AIR CONDITIONING CATALOG*—Fan performance data, heating and cooling coil performance, filter data, information on mixing boxes, and physical and dimensional specifications are included in the manufacturer's 32 page, two color catalog. Young Radiator Co., 709 S. Marquette St., Racine, Wis.

▶ *AIR DIFFUSERS*—A two color, 16 page manual contains engineering data and specifications on the manufacturer's "Flexiflo" air diffusers. Selection charts are included. Universal Diffuser Corp., 1360 Garrison Ave., New York 59.

▶ *ALUMINUM PRODUCTS AND SERVICES*—Information on aluminum mill products and services is contained in a 24 page booklet. Data on alloys, forms, properties, applications and availability is included. Kaiser Aluminum & Chemical Sales, Inc., Industrial Service Div., 1924 Broadway, Oakland 12.

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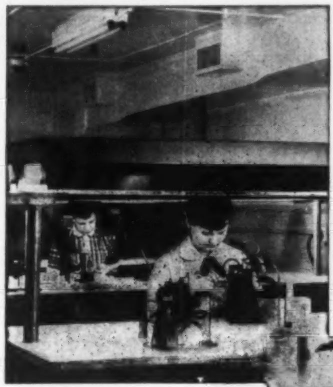

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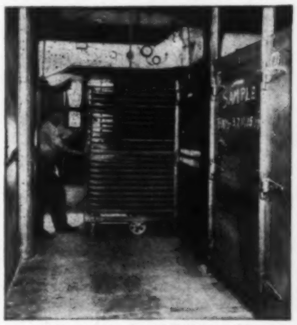

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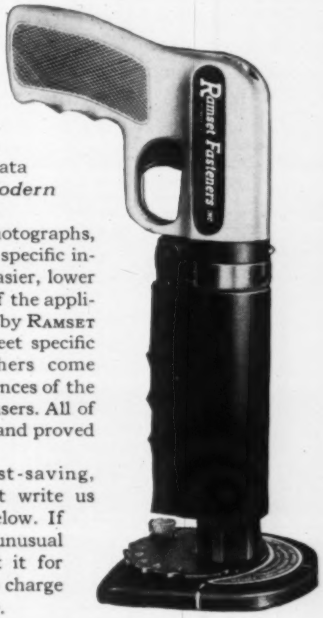

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▶ *BASEBOARD CONVECTORS*—Descriptive information, capacity data, selection procedure, method of installation, roughing-in dimensions and architectural specifications are contained in the manufacturer's "Perimaheat" catalog. Young Radiator Co., 709 S. Marquette St., Racine, Wis.

▶ *BELLOWS AND FLEXIBLE METAL HOSE*—Sixteen page catalog 145 is pointed toward the design engineer and offers information necessary to design bellows and metal hose as components of equipment. Flexonics Corp., 1391 S. 3rd Ave., Maywood, Ill.

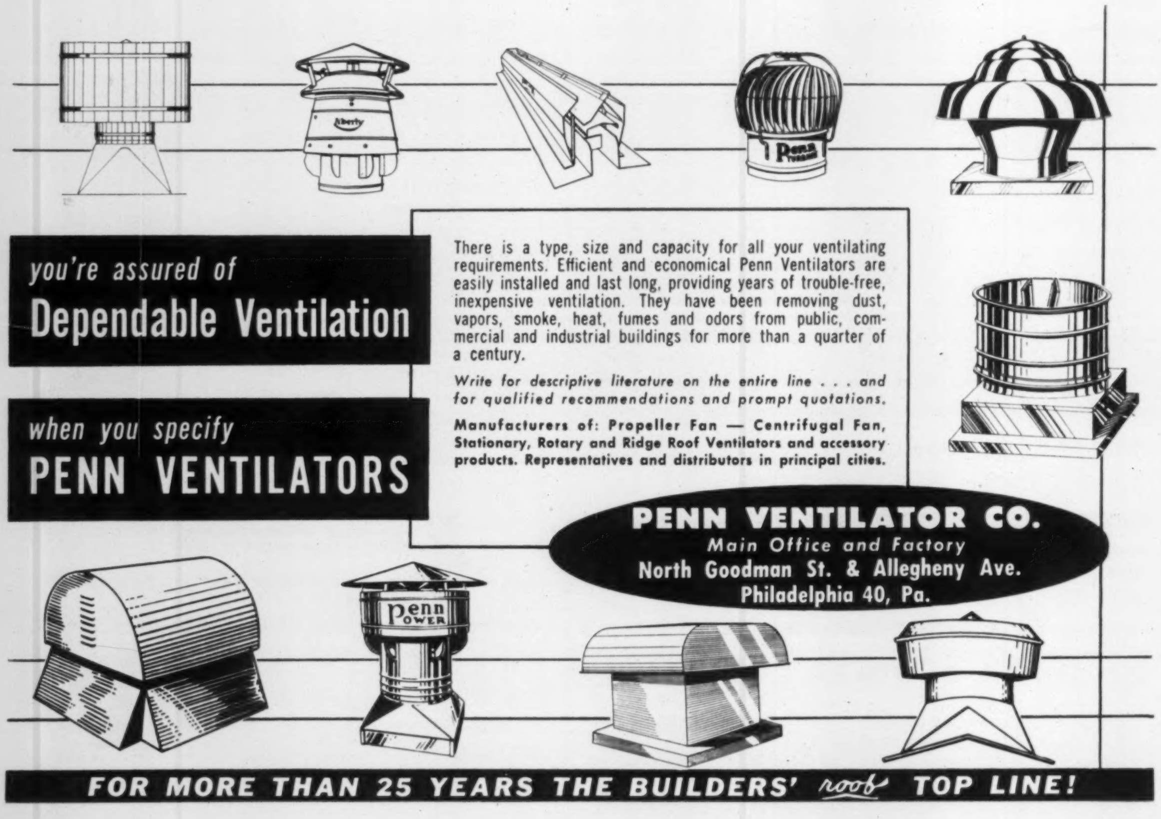
▶ *BOILERS*—A four page bulletin describes the manufacturer's type "C" split sectional boiler for multiple family dwellings and large structures. Portmar Boiler Co., Inc., 193 7th St., Brookyn 15.

▶ *BRONZE BEARINGS*—Over 600 sizes of porous bronze bearings, designed to be oil retaining, are listed in the manufacturer's stock list No. 4. Information on application, installation, lubrication and machining is included. Bound Brook Oil-less Bearing Co., Bound Brook, N. J.

▶ *CAPACITIVE LEVEL INDICATOR*—A meter indicating level monitor deriving its signal from an inert capacitive-type sensing probe is described in a new leaflet, form LI-2. The panel mounting instrument is recommended by the manufacturer for applications with most nonadhesive chemicals, some refrigerants, and all condensed gases over a temperature range from 500 to −425 F. Thermo Instruments Co., 1310 Old County Rd., Belmont, Calif.

▶ *CHART FOR ALUMINUM DESIGNATION SYSTEM*—A new chart describes the new Aluminum Designation System developed by the Aluminum Association. Included are both new and old designations for conversion and descriptions of the workings of the four digit index system. Peter A. Frasse and Co., Inc., 17 Grand St., New York 13.

▶ *CIRCULAR CHART CONTROLLERS*—Specification 163-1, *ElectroniK Circular Chart Pneumatic Con-*



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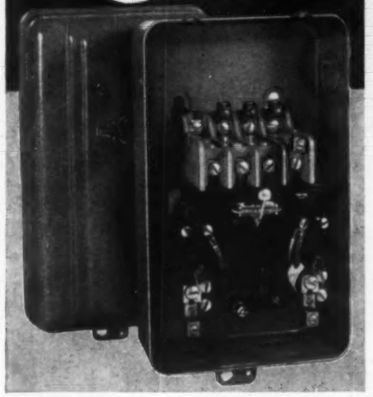

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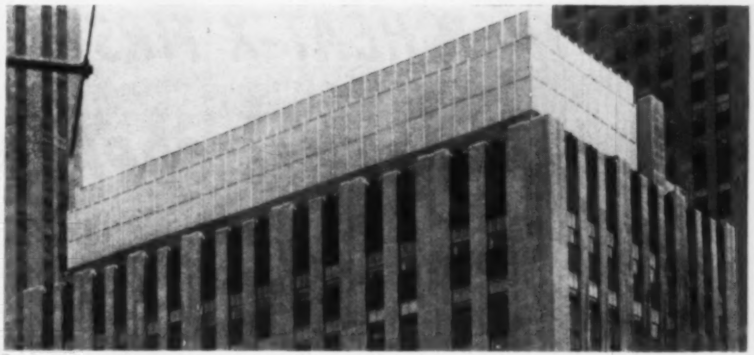

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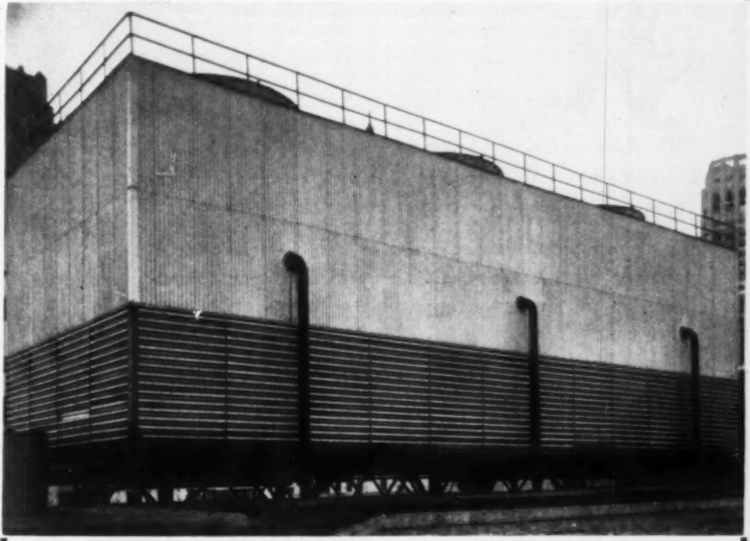

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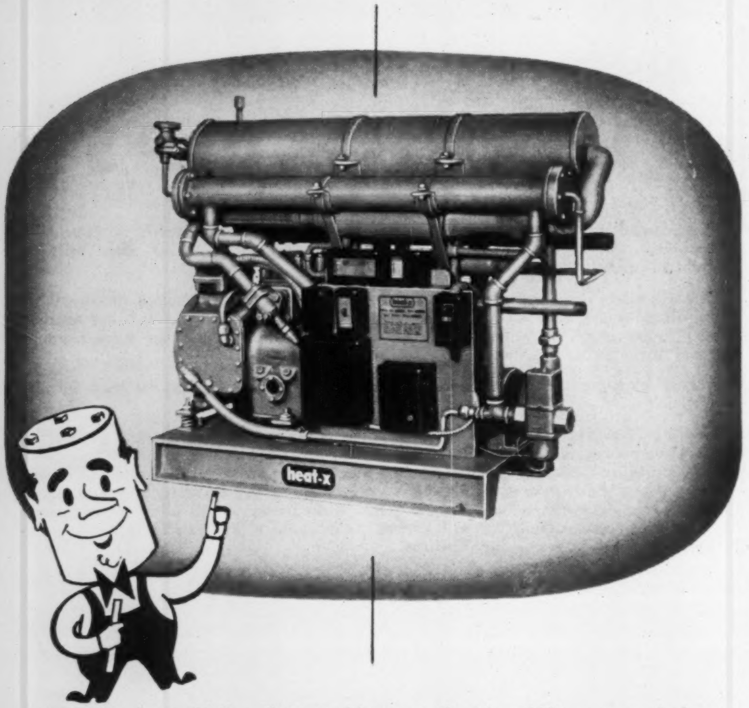

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RECENT TRADE LITERATURE

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trollers, lists specifications for these instruments and furnishes a listing of the control forms available. Minneapolis-Honeywell Regulator Co., Wayne and Windrim Aves., Philadelphia 44.

▶ *COMBUSTIBLE GAS ANALYZERS AND ALARMS*—A 20 page brochure contains part-by-part descriptions of the components of the manufacturer's analyzers. Actual installations in varied industries are covered. A method of designing a gas alarm system is shown schematically. Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8.

▶ *CONSTANT SPEED MOTOR*—Described in leaflet SC-23, is a motor recommended for applications calling for constant speed under varying voltage, load and ambient conditions throughout a wide range of temperature, pressure and humidity variations. Dalmotor Co., 1395 Clay St., Santa Clara, Calif.

▶ *CONTROLLED CAPACITY PUMPS*—Bulletin S-1254 contains 16 pages of information on the manufacturer's controlled capacity pumps and liquid proportioning equipment. Philadelphia Pump and Machinery Co., Inc., 1513 Race St., Philadelphia.

▶ *COUPLINGS*—Included in a bulletin describing the manufacturer's line of couplings is an illustration showing an exploded view and a table containing data necessary to select the proper coupling for a given application. De Laval Steam Turbine Co., Trenton 2.

▶ *DIRECT DRIVE FAN MOTORS*—A two page bulletin illustrates and gives specifications for the manufacturer's series of three new totally enclosed, direct drive fan motors. Electric Motors and Specialties, Inc., King and Hamsher Sts., Garrett, Ind.

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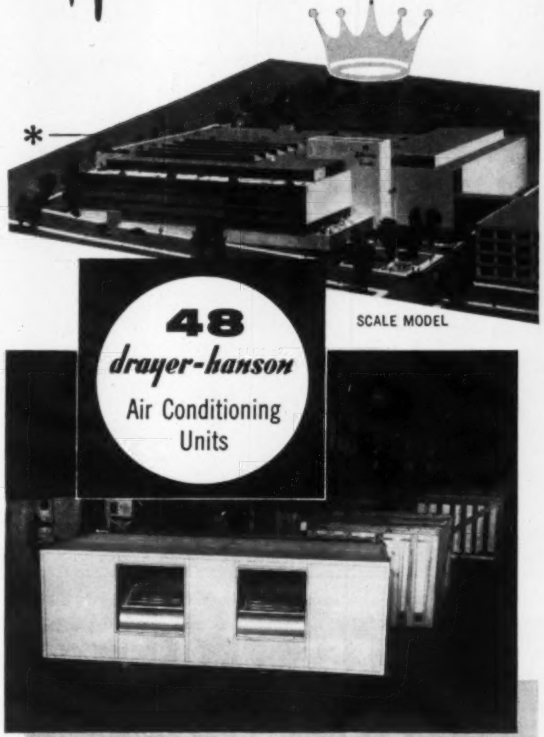

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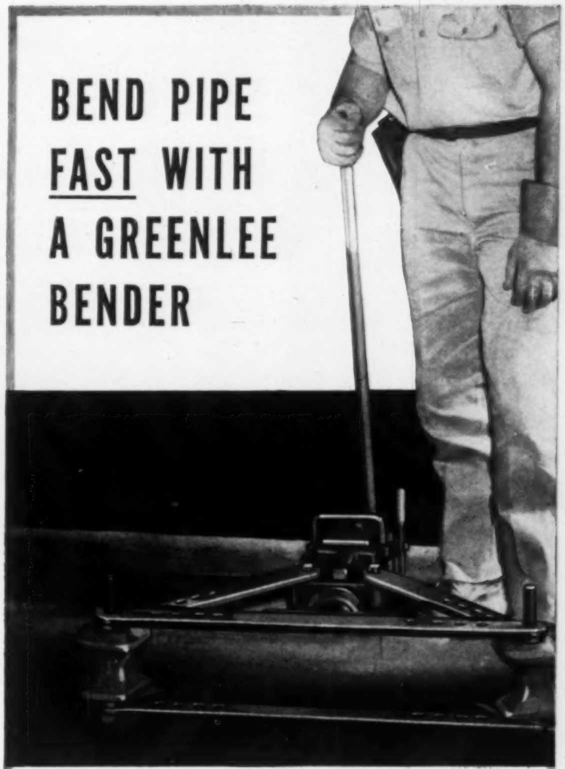

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Greenlee timesaving tools for plumbing and heating work: Hydraulic Pipe Pushers • Hydraulic Pipe Benders • Tubing Benders • Pipe Bits Auger Bits • Spiral Screw Drivers • Chisels • And many more Greenlee Tool Co., 2341 Twelfth Street, Rockford, Illinois

RECENT TRADE LITERATURE

Continued

▶ *DRAFT GAGES*—Publication 54-1060-210 discusses the manufacturer's diaphragm operated "Vertiscale" gages, a new design in draft gages. Hays Corp., 800 E. 8th St., Michigan City, Ind.

▶ *DUST CONTROL*—Bulletin No. 550-D presents three illustrated case histories in the manufacture of pharmaceutical products, covering dust control at tablet presses, packagers, mixers, dryers, and materials conveying equipment. American Wheelabrator & Equipment Corp., 1321 S. Byrkit St., Mishawaka, Ind.

▶ *ELECTRIC-WELD STEEL TUBING*—A four page bulletin covering the manufacturer's line of tubing features a chart giving size tolerances. Nikoh Tube Co., 5000 S. Whipple St., Chicago 32.

▶ *EQUIPMENT AND SUPPLY CATALOG*—An illustrated 124 page catalog covering the company's line of equipment and supplies, is cross indexed and contains engineering data and a separate price supplement. Air Conditioning and Refrigeration Div. of Standard Brass & Mfg. Co., Port Arthur, Texas.

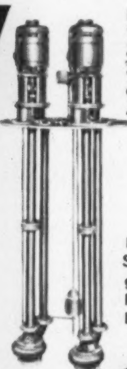
▶ *EVAPORATIVE CONDENSERS*—A six page brochure covers the manufacturer's redesigned, reengineered "Perma-Fan" evaporative condensers. Drayer-Hanson, Inc., P. O. Box 2215, Terminal Annex, Los Angeles 54.

▶ *EYESHIELD FOR SAFETY HEADGEAR*—Bulletin 0302-3 describes a formed plastic eyeshield designed for cap mounting on any of the manufacturer's line of protective headgear. Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8.

▶ *FILTER FABRICS*—Primary properties of an efficient filter fabric and the influence of cloth weave are discussed in an article, *An Evaluation of Filter Fabrics*, in the manufacturer's *Dust and Fume Topics*. American Wheelabrator & Equipment Corp., 1404 S. Byrkit St., Mishawaka, Ind.

▶ *FLEXIBLE CONNECTOR FOR HEATING INSTALLATIONS*—A two page leaflet contains information on service, construction, availability and installation suggestions for "Flexpipe," a flexible, phosphor bronze connector for heating installations. The American Brass Co., American Metal Hose Branch, Waterbury 20, Conn.

Why the RIGHT PUMP COSTS LESS —When it's an American-Marsh Pump!



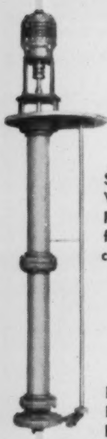
NKS — Duplex Vertical Non-clog Sewage and Sump. Request Bul. 325ACP.

Pumps may "look alike"—but differ enormously in performance and economy when pumping a given liquid. Sometimes this is caused by "adapting" an unsuitable pump to a job.

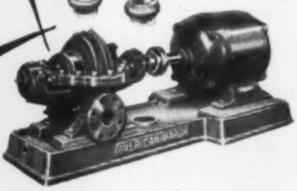
At American-Marsh, scrupulous care assures that every pump—for whatever purpose—is the *right* pump through and through!

When you ask for recommendations, we analyze your problem carefully. Then we'll suggest the *right* design and size for your job ... the *right* material for wetted parts (cast iron, bronze, stainless steel or other) ... the *right* type of bearing, etc.

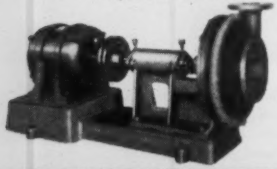
You're assured of a lasting solution to your pumping problem ... and a pump that costs *less* for the service delivered. *Call your A-M Representative now for recommendations.*



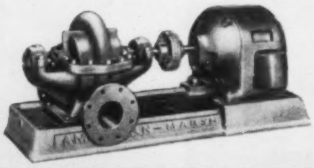
Special — Q-2 Vertical Wet Pit Centrifugal for acids and caustics.



HHM — Two-Stage Centrifugal, Boiler Feed. Request Bul. 381CP.



RDM, Single Stage End Suction Centrifugal Request Bul. 300CP.



HLM Single Stage Centrifugal. Request Bul. 350CP.

Pumps and Pumps only Since 1873

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BATTLE CREEK MICHIGAN

In Canada:
American-Marsh Pumps (Canada) Ltd., Stratford, Ont.

CENTRIFUGAL, TURBINE, STEAM AND POWER PUMPS FOR TESTING, PROCESSING, BOILER FEED, FIRE PROTECTION, ETC.

For Dependable Wiring—

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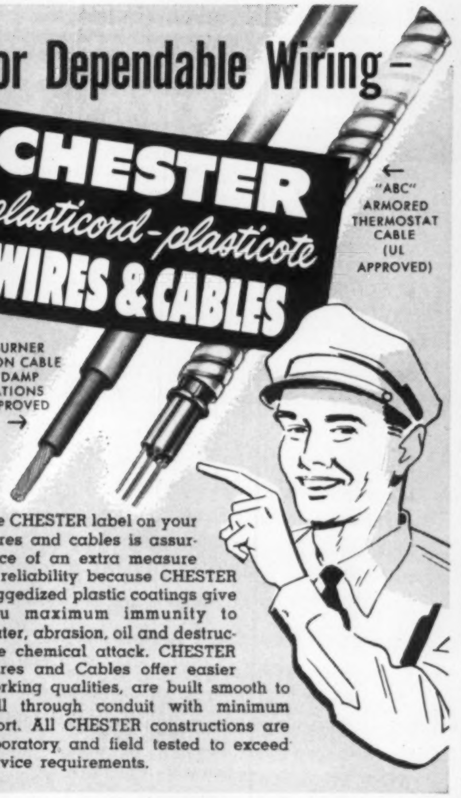
WIRES & CABLES


"ABC" ARMORED THERMOSTAT CABLE (UL APPROVED)
OIL BURNER IGNITION CABLE FOR DAMP LOCATIONS UL APPROVED

The CHESTER label on your wires and cables is assurance of an extra measure of reliability because CHESTER ruggedized plastic coatings give you maximum immunity to water, abrasion, oil and destructive chemical attack. CHESTER Wires and Cables offer easier working qualities, are built smooth to pull through conduit with minimum effort. All CHESTER constructions are laboratory and field tested to exceed service requirements.

STANDARD OIL BURNER IGNITION CABLE.

FLEXIBLE STEEL CONDUIT

PLASTICOTE THERMOSTAT CABLE

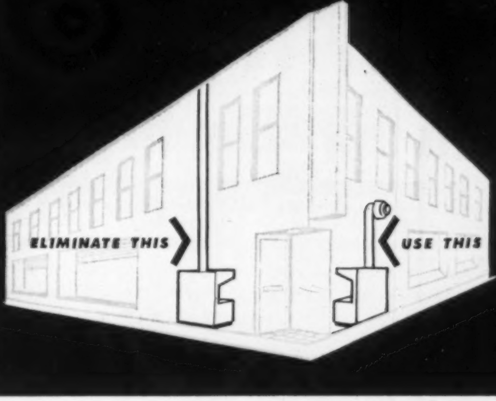
TW BUILDING WIRES

INSTRUMENT WIRE

"Chesty" says —
For Dependable Wiring,
Connect It with Chester!

CHESTER CABLE CORP.
CHESTER, NEW YORK

The LONG
and the SHORT of it...

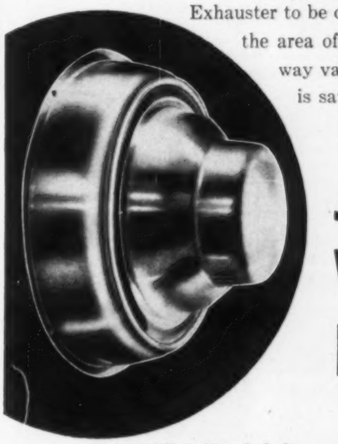


... HOW TO CUT DUCT COSTS

This is the story of how to save money on ventilating—the story of long duct runs vs. short ducts.

PROBLEM: To reduce long and elaborate duct runs connected to power exhausters—runs that often cost more than the heart of the system, the fan, itself. This problem is more acute in multi-story construction or existing structures where ducts are brought through upper floors to the roof.

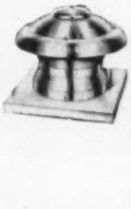
SOLUTION: Use Jenn-Air Wall Exhausters . . . thus eliminating most duct work. One simple opening through the outer wall permits the Wall Exhauster to be connected directly to the area of ventilation. In this way valuable interior space is saved and installation costs are reduced.



JENN-AIR
Wall Exhausters

Visit us in Booth 27 at the ASH & VE Show.

The Long and Short of It on the Roof



Jenn-Air Low-Contour Roof Exhausters
Design blends with today's buildings. Gone are unsightly penthouses, and gravity stacks. First with spun aluminum construction, Jenn-Air Exhausters are setting the trend in the field.

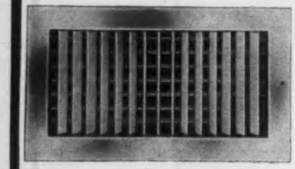
JENN-AIR PRODUCTS COMPANY, INC.
Architects & Builders Building
Indianapolis, Indiana

"GENERAL"
the name that stands for ... QUALITY in air conditioning

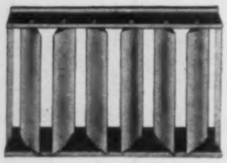
REGISTERS and GRILLES

Already acclaimed one of the leaders in the commercial grille field, the consistent quality of General products is bringing the name "preferred acceptance" across the country—with those who know.

G-R precision workmanship—and mass output—are the result of the finest in high-production facilities. Investigate the line that's—"Second to None."

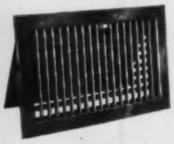


EVERYTHING STREAMLINED
General adjustable registers and grilles are streamlined throughout for appearance and operating efficiency, including fins, damper blades, and radius edges of the solid frame.

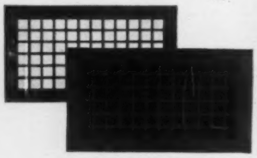


Silentite DAMPER
Standard on General registers or furnished separately, the *Silentite* opposed-blade damper controls volume without turbulence. Reinforced hollow blades of great strength allows positive gripping of bearings for easy action without rattling.

Cross section shows streamlined contour.



"RANCH HOME"
Adjustable residential winter-summer heating-cooling model.



STAMPED GRILLES
Plain Lattice, Pencil-proof (schools), Sanitary (hospitals).

DUCTROL
Line includes air directors, mounting frames, fusible links, door grilles, various accessories, metals and finishes.

A Complete Line
For Cooling and Ventilating

Write for Catalog On Your Letterhead

GENERAL REGISTER CORPORATION
14 Factory Street Cedar Grove, N. J.

RECENT TRADE LITERATURE

Continued

▸ *FLEXIBLE STAINLESS STEEL TUBING*—Bulletin No. STC-1 gives data and specifications on tubing for conveying corrosive materials at high temperatures, absorbing vibration, and compensating for misalignment. The American Brass Co., American Metal Hose Branch, Waterbury 20, Conn.

▸ *FLUOROCARBON FILTER*—Properties of porous "Kel-F" plastic and design and performance data on complete filters equipped with this new filter medium are included in a booklet from the Porous Plastic Filter Co., 30 Sea Cliff Ave., Glen Cove, N.Y.

▸ *HERMETICALLY SEALED RELAYS*—Details on housings, settings, motors, operation, calibration, accuracy and reliability of manufacturer's new line of hermetically sealed adjustable time delay relays are given in bulletin A. W. H. TD401. The A. W. Haydon Co., 230 N. Elm St., Waterbury 20, Conn.

▸ *HOSPITAL HEATING AND AIR CONDITIONING*—Bedroom heating and air conditioning problems in hospitals are shown graphically in a booklet prepared by Minneapolis-Honeywell Regulator Co., 2753 4th Ave., Minneapolis.

▸ *HOT WATER SUPPLY SYSTEMS*—*The New Approach to the Design of Hot Water Supply Systems* discusses major problems of steam surges, steam demand, accurate temperature control, storage requirements, safety devices and scale formations. Aerco Corp., Northvale, N.J.

▸ *HUMIDITY CONDITIONING*—Bulletin K1554 discusses air conditioning requirements at low relative humidity as set by the brewery industry. Surface Combustion Corp., 2375 Dorr St., Toledo 1.

▸ *INDUSTRIAL LIQUID METERS*—Bulletin 567 contains details of several new industrial liquid meters including a chart for the selection of the proper size and type for any given application. Neptune Meter Co., 19 W. 50th St., New York 20.

▸ *INSULATION*—Literature from the manufacturer discusses the application of a joist space heat tester to compare reflective insulation with other thermal insulations. Infra Insulation, Inc., 525 Broadway, N.Y.

▸ *LOW PRESSURE REFRIGERATING UNITS*—Bulletin 97-E illustrates and describes applications of the manufacturer's accessible-hermetic and open-drive cooling units. Frick Co., Waynesboro, Pa.

Cut customer fuel bills 7 days a week

it's good business to always install a PARAGON 700 Series Calendar Time Switch on commercial heating units

YES, the good word gets around fast when a Paragon 700 Series Time Switch is on the job cutting heating bills. Heat is *automatically turned off* when not needed. Customer satisfaction through lower fuel bills *plus* fewer service "call backs" are big profit boosters for you! Check these features: :

- **COMPLETELY FLEXIBLE** — completely economical. Switch settings can be made for the entire week's schedule, yet easily and quickly changed. ON-OFF or OFF-ON operation can be as close as 3 hours.
- **FULLY AUTOMATIC** — set it, then forget it. Saves money weekends, for example: switch may be set to cut off heat Saturday noon, then automatically start regular heating cycle earlier than usual Monday.
- **INSTANTLY CHANGEABLE** — simply set the dial trippers at desired day or night hours. Total of 14 are supplied as standard equipment.

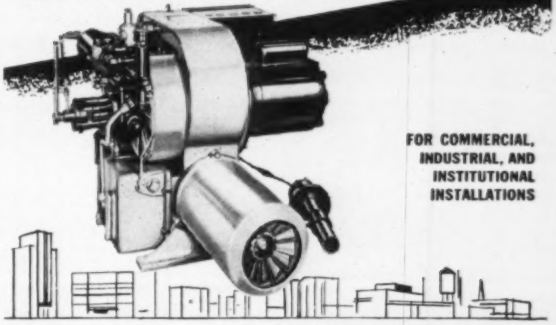
Ask for Bulletin HP-5407

See your jobber, or write:

Dial is graduated in hours and half-hours. Night and day periods clearly separated. Available in 24, 120 and 240 volts; 25, 50 and 60 cycles. No complicated wiring. Lists as low as $27.50.

PARAGON ELECTRIC COMPANY
TWO RIVERS, WISCONSIN
World's Foremost Manufacturer of Time Controls

Hev-E-Oil Burner keeps heat cheap!



FOR COMMERCIAL, INDUSTRIAL, AND INSTITUTIONAL INSTALLATIONS

Use heavy fuel oils *costing 30% less per gallon*

Cheap heat is smart economy! That's why thousands of owners are converting to Hev-E-Oil Burners and using *commercial* No. 4 or 5 heavy oils, costing 3 to 6¢ *less* per gallon than domestic light oils. Owners not only pocket the difference in cash, but get 7% more heat per gallon as well.

Hev-E-Oil Burners are specifically designed for heating buildings requiring more than 6,000 gallons of oil or 45 tons of coal per year.

Conversion is simple. The Hev-E-Oil fits all types of standard heating boilers and change-over takes only a few hours' time. Reports on file show fuel savings pay for conversion in a season or two.

QUICK FACTS ON HEV-E-OIL BURNER

- Automatic, all-electric ignition
- Flame size set exactly to furnace capacity
- Low-pressure, air-atomizing, with large, non-clogging nozzle
- Six sizes: 1 to 60 gph
- Built-in low fire start
- As simple to install as a domestic burner
- Easy servicing and cleaning
- Air and oil metered to give high efficiency

If you own, specify, install or service burners, get all the facts about Hev-E-Oil Burner — a *quality* product of America's leading manufacturer of self-contained boilers and oil-fired equipment. Write for illustrated Bulletin AD-102 NOW. CLEAVER-BROOKS COMPANY, Dept. A-381 E. Keefe Ave., Milwaukee, Wis.

Sales and Service In Principal Cities

Cleaver Brooks

HEV-E-OIL BURNERS ARE DESIGNED TO SAVE YOU MONEY

RECENT TRADE LITERATURE

Continued

▶ *MASONRY DRILLING*—A four page manual gives information on drilling soft, medium hard or extremely hard masonry, and correct drills and bits to be used. Included is data as to the sizes of holes necessary to accomodate various sizes of anchors, expansion bolts, pipes and conduit. New England Carbide Tool Co., Inc., 60 Brookline St., Cambridge 39, Mass.

▶ *MOTOR-COMPRESSOR SERVICE MANUAL*—The manufacturer's 28 page manual is divided into two main sections covering electrical and mechanical service data on the "Copelametic" accessible hermetic motor-compressor. Copeland Refrigeration Corp., Sidney, Ohio.

▶ *MULTIPLE ROOM AIR CONDITIONERS*—Data about air conditioning an entire building with individual packaged units includes information on initial cost, operating cost, special problems relating to installation, operation and maintenance, and performance. Air Conditioning Div., Philco Corp., Tioga and C Sts., Philadelphia 34.

▶ *OIL BURNER MAINTENANCE*—A brochure designed to impart techniques for economical and efficient oil burner heating includes a year round schedule of maintenance showing how to keep heating plant operating expenses at a minimum. H. Lieblich & Co., Inc., 36 W. 66th St., New York 23.

▶ *PACKING SELECTOR*—An aid to the layman in choosing the right industrial packing is a 6 in. cardboard disc. Shown on the circular selector are packing styles and temperature readings for gaskets, valve stems and centrifugal and reciprocating pumps. The material being handled, water, steam, brine, ammonia, etc., is printed alongside a window on a second and smaller disc mounted on the larger one. New York Belting & Packing Co., 1 Market St., Passaic, N. J.

▶ *PETROLEUM PIPE LINES*—Bulletin PL-1 discusses the problems involved in transporting liquid petroleum through pipe lines. The bulletin describes a typical system, the variables to be measured, and some of the problems of pipe line control. Minneapolis-Honeywell Regulator Co., Wayne and Windrim Aves., Philadelphia 44.

▶ *PIPING*—Technical data on wrought iron piping in heating and air conditioning installations includes size and dimensional information for both butt and

Niagara **Water Cooling Towers**

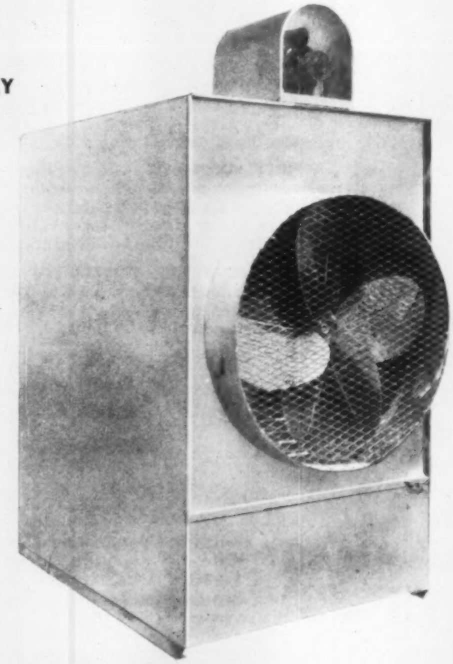
ENGINEERED TO OPERATE ADEQUATELY UNDER EXTREME ATMOSPHERIC CONDITIONS

The NIAGARA line of induced-draft cooling towers are constructed of heavy (14 ga.) galvanized sheet-steel for long-lasting operation. They are lined with a water and noise repellent sealer and are giving years of trouble-free use. Externally mounted and hooded motors on all models. Time-proven, twin-bearing assemblies are under protective splash cover and have extended oilers to facilitate maintenance. The deep-pitched fan blades give maximum draft at low speeds and provide quietness of operation. The extra-large wetted-deck surface is of all redwood for years of fungus-free operation. All models are conservatively rated and will handle your most perplexing water-cooling problems. Write for descriptive literature and engineering data.

NIAGARA PRODUCTS COMPANY

4311 East Thomas Road **Phoenix, Arizona** **Phone CR4-7632**

Distributors' Inquiries Invited **Telephone No Charge.**



Fans FOR EVERY Industry

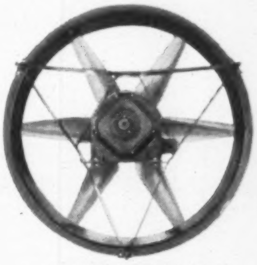
SOUTH BEND
SOUTH BEND AIR PRODUCTS INC
INDIANA

AEROSPOT *and* DYNAFLOW

Aerospot and *Dynaflow* fans rate high in efficiency and safety features . . . offer advanced aerodynamic design and rugged construction. The models shown enjoy wide popularity with industrial users. Any unit may be furnished with **explosion-proof** motor and fan blades.

HEAVY DUTY AEROSPOT

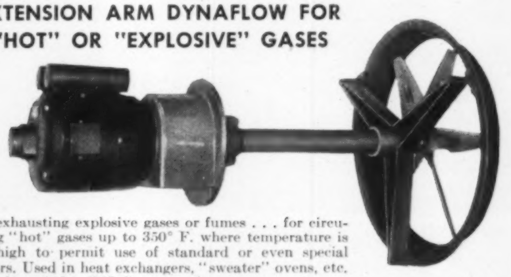
For general or specific ventilation, man-cooling, or parts-cooling . . . to increase personnel efficiency and reduce lost time in cooling and drying hot parts. Portable . . . direction of blast adjustable. Explosion-proof motor, metal conduit and starter can be supplied. Conforms to state safety regulations.



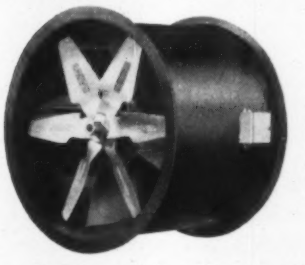
DYNAFLOW UNITS 2-4-6 BLADE TYPES

Six blade model illustrated. For exhausting or blowing against high static pressures. For general ventilation or specific processes where fumes are present. Sizes: 16" to 36" diameter. Capacities: 1240 to 26000 c.f.m. Two and four blade models available for applications at lower static pressures.

EXTENSION ARM DYNAFLOW FOR "HOT" OR "EXPLOSIVE" GASES



For exhausting explosive gases or fumes . . . for circulating "hot" gases up to 350° F. where temperature is too high to permit use of standard or even special motors. Used in heat exchangers, "sweater" ovens, etc. Fans from 16" to 36" diameters.



DUCTYPE UNITS

Direct Drive or Belt Drive

Direct drive model shown, also supplied with belt drive for high temperatures or corrosive air and gas handling. Designed for bolting in any duct run at any point or at either end. Sizes: 16" to 36" fans.

Send for complete specifications and listings of other fans available.

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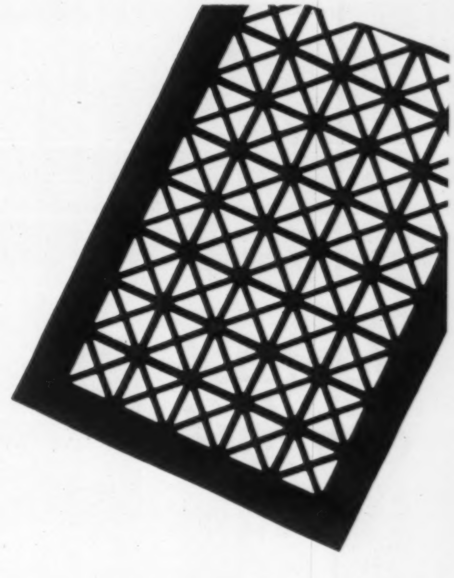
SOUTH BEND AIR PRODUCTS, Inc.
322 EAST COLFAX AVENUE • SOUTH BEND 22, INDIANA



for *Enhancing* beauty

Add a touch of beauty and utilitarian design to your decorative motif with Hendrick Perforated Metal Grilles. Your clients will go for that extra elegance they add to a room.

Hendrick Perforated Metal Grilles provide more-than-ample open area for free passage of air and are available in over one hundred attractive basic designs to choose from. And they're easy to install because they always lie flat — they won't bend or warp. For more complete details write Hendrick direct.

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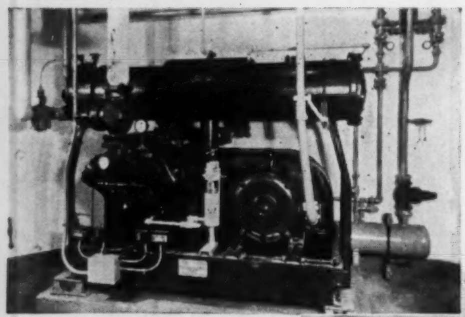
Perforated Metal • Perforated Metal Screens • Wedge-Slot Screens • Architectural Grilles • Mitco Open Steel Flooring • Shur-Site Treads • Armorgrids



One of the three Vilter self-contained condensing units installed in the Union League Club of Chicago.

Union League Club of Chicago.

for cool comfort in clubs

✓CHECK with VILTER

● A bustling city club is a beehive of activity—a friendly gathering of the clan . . . a full house . . . all the blessings of gemütlichkeit . . . the conviviality of associates. A true picture, yes, even on the hottest, most humid summer day—provided the club is comfortably air conditioned . . . *Vilter conditioned.*

Such a year-round busy place is the world famous Union League Club of Chicago where an appreciation of quality extends even to its choice of air conditioning—*Vilter conditioning:* engineered to provide the *right* temperature conditions . . . dependable . . . economical to operate . . . quiet!

The "all Vilter" system air conditions nine floors of the Union League Club . . . approximately 65,000 square feet! Two 65-ton and one 90-ton self-contained condensing units provide the refrigeration. Furthermore, all units are interconnected to supplement or reinforce one another so that 50% of the total capacity can be concentrated on any one of several large rooms during peak use periods. All units are under automatic control.

You, too, can make your club a year-round success . . . a comfortable spot . . . even in the heat of summer. Therefore, plan on a Vilter air conditioning system now, so that it will be ready when early Spring and Summer heat strikes. Vilter know-how guarantees you a "top" installation which requires a minimum of attention and a real "plus" in economy of operation. Specify Vilter.

Vilter®

Your nearby Vilter Representative or Distributor will be glad to show you how Vilter refrigeration can help you.

REFRIGERATION and AIR CONDITIONING

THE VILTER MANUFACTURING COMPANY, MILWAUKEE 7, WIS.

Air Units • Ammonia & Freon Compressors • Booster Compressors • Baudelot Coolers • Water and Brine Coolers • Blast Freezers • Evaporative & Shell & Tube Condensers • Pipe Coils • Valves & Fittings • Pakice and Polarflake Ice Machines

RECENT TRADE LITERATURE

Continued

lap weld pipe. A. M. Byers Co., Clark Bldg., Pittsburgh 22.

▶ *PLANT LAYOUT—The ABC of the Repro-Templet Method of Plant Layout* is the manufacturer's brochure which explains and illustrates a method of plant layout using his acetate reproductions of plant equipment on a film grid sheet representing a plant floor plan. Repro-Templets, Inc., Oakmont, Pa.

▶ *PLANT AND MACHINERY EFFICIENCY*—Bulletin R541A discusses eight steps in attaining efficiency objectives including: keeping production and assembly lines flexible, keeping maintenance off the production line, and checking the effect on product quality of building-borne vibration. Barry Corp., 765 Pleasant St., Watertown 72, Mass.

▶ *PLASTIC PIPE, FITTINGS, VALVES*—Technical data on "Dur-Ace," a general purpose corrosion-resistant plastic pipe is presented in manufacturer's bulletin 80-A. American Hard Rubber Co., 93 Worth St., New York 13.

▶ *PLUG-MOUNTED RELAYS*—Circulars 1801-1805 describe a complete line of industrial relays, plug-mounted for advantages in assembly, servicing and maintenance. Automatic Sales Corp., 1033 W. Van Buren St., Chicago 7.

▶ *POROUS STAINLESS STEEL, ALLOYS*—Types, performance and application data for stainless steel and other metals with controlled porosity are presented in a 45 page booklet. Micro Metallic Corp., 30 Sea Cliff Ave., Glen Cove, N.Y.

Sterlco® CONDENSATE PUMPS
Engineered to the job!

COMPACT DESIGN
Large capacity tank provides plenty of condensate storage in a minimum floor space. Low inlet and all over simplicity of design eliminates unnecessary gadgets and excessive weight.

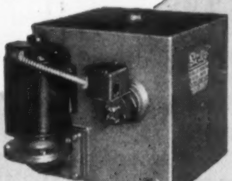
MOTOR
Vertically mounted—capacitor type. Dynamically balanced, permanently lubricated with automatic thermal overload.

FLOAT SWITCH
New, rugged, positive action float switch — easily adjustable to suit the requirements of a specific installation. Float switch and motor wired.

ROTARY SEAL
Good for thousands of hours of normal service—keeps corrosive condensate from motor shaft.

SERIES 4200
Cast iron tank

BRONZE IMPELLER
No close clearances — no shimming or adjustment.



SERIES 4100
Steel tank — same operating features

and EASY TO STOCK!
Only two sizes required to take care of jobs up to 15,000 sq. ft. E.D.R. — and up to 20 lbs. discharge pressure. *For you* this means less working capital tied up in floor stock. *For your customers* this means future increase in radiation may not require a new pump.

Sterlco Products
Distributed through
LEADING HEATING and PLUMBING WHOLESALERS

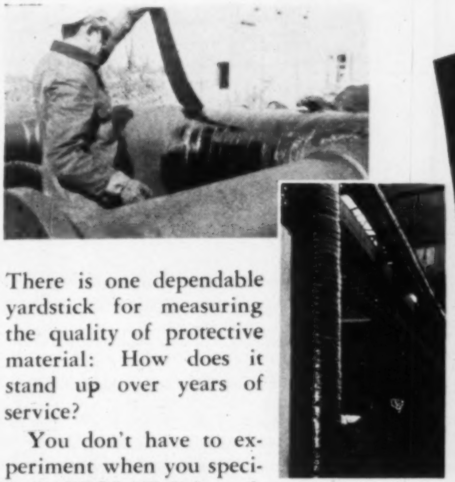
STEAM HEATING is MODERN, EFFICIENT and DEPENDABLE

STERLING, INC.
3732 N. Holton St., Milwaukee 12, Wisconsin

CONDENSATION AND VACUUM PUMPS
HEATING SPECIALTIES
TEMPERATURE CONTROLS

Is the Protection You Buy TIME-TESTED Like TAPECOAT®

...the Quality Coal Tar Coating



1941
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There is one dependable yardstick for measuring the quality of protective material: How does it stand up over years of service?

You don't have to experiment when you specify TAPECOAT. It is quality coal tar coating, and coal tar is nature's own defense against corrosion.

Since 1941, when it was introduced as the first protective coating in handy tape form, TAPECOAT has proved its ability to keep vulnerable steel surfaces in "like new" condition year after year. *That's why it is specified by those who know that continuing protection is the first consideration.*

For 13 years, TAPECOAT has provided dependable protection on pipe, pipe joints, tanks, etc., above ground and under ground.

TAPECOAT comes in handy rolls in widths from 2" to 24". It's easy to apply and the coal tar provides both bond and protection at the same time.

Write for brochure and recommendations on your corrosion problem.

The TAPECOAT Company
Originators of Coal Tar Tape Protection
1555 Lyons Street, Evanston, Illinois

RECENT TRADE LITERATURE *Continued*

▶ *PNEUMATIC-ACTUATED LEVEL CONTROL*—Equipment designed to provide a link between the capacitive-type electronic level-sensing equipment and the corresponding actuation of pneumatic control valves or other instrumentation is described in form CP2. Thermo Instruments Co., 1310 Old County Rd., Belmont, Calif.

▶ *POWER AND GRAVITY ROOF VENTILATORS*—Contained in an eight page, two color catalog are technical data and capacity ratings with photo illustrations of the manufacturer's line of propeller fan, centrifugal, stationary, rotary and ridge roof ventilators and accessory products. Penn Ventilator Co., 3252 Goodman, Philadelphia 40.

▶ *PRODUCT DIGEST ON ISOLATORS*—A four page illustrated brochure gives brief descriptions of the company's standard isolators, including miniature mounts. Barry Corp., 1000 Pleasant St., Watertown, Mass.

▶ *RAILROAD PIPE FITTINGS—Socket Welded Forged Steel Pipe Fittings for the Railroad Industry* includes product descriptions and engineering data on the company's socket-welded fittings. Watson-Stillman Fittings Div., H. K. Porter Co., Inc., P.O. Box 95, Roselle, N.J.

▶ *RECEIVER TANK AND SUMP PUMP*—Information on receiver tank with sump pump and control includes a diagram, specifications and features. Flight Mfg. Corp., 925 N. 8th St., Camden 2, N.J.

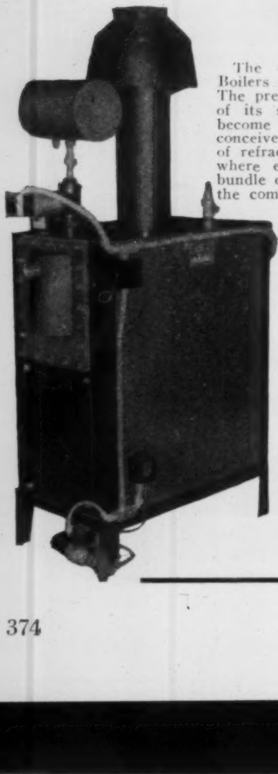
▶ *RECORDERS AND CONTROLLERS*—Bulletin 7201 describes the "Tel-O-Set" miniature recorder and controller. Complete specifications are included. Minneapolis-Honeywell Regulator Co., Wayne and Windrim Aves., Philadelphia 44.

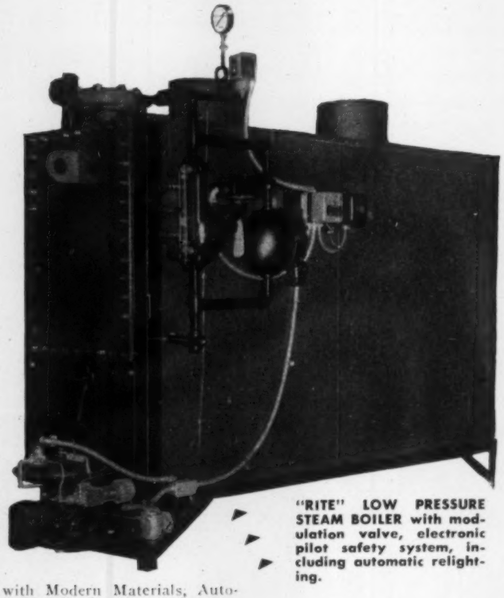
▶ *REPEAT CYCLE DIAL TIMER*—An illustrated folder, describing "Duo-Set" timers for controlling on-off cycling of two independently adjusted load circuits in machine and process control, lists timers with nine dial ranges from 30 sec to 4 hr and minimum settings as low as ½ sec. Automatic Temperature Control Co., Inc., Dept. N. 5212 Pulaski Ave., Philadelphia 44.

▶ *SPECIAL EQUIPMENT*—A new bulletin outlines the company's services in four fields: design and con-

The "Rite" Story Behind The "Rite" Trade Mark

RITE "LIME-LITE" with built-in heat Exchanger, having full boiler output.





"RITE" LOW PRESSURE STEAM BOILER with modulation valve, electronic pilot safety system, including automatic relighting.

The finest, largest, and MOST EFFICIENT Boilers ever built are of WATER TUBE design. The pressure sections are built of STEEL. Because of its superior durability and strength, steel has become the most widely used structural material conceived by man. The fire box sections are built of refractory brick. Essentially, they are a furnace, where efficient combustion can take place, and a bundle of water-filled tubes to extract the heat from the combustion products.

Boilers of this type can be found in practically every large city in the world as a power source for a pumping station or electrical power plant. The amazing thing about this fact is many of them were installed during the late 1800's or shortly after the turn of the century and they are still giving faithful, efficient service. To thousands of architects, engineers, and users the words WATER TUBE, STEEL, EFFICIENCY, PERMANENCE became SYNONYMOUS.

Now, by combining these fine features with Modern Materials, Automatic Controls, and Production Engineering, Rite Engineering and manufacturing Corporation offers to the heating and air conditioning trade a Completely Automatic Water Tube Boiler at reasonable cost. 33 Different Sizes — Gas, Oil or Gas Combination, Water Heating, Hot Water Supply, Low Pressure Steam. Both Steam and Water Boilers with Built-in Heat Exchanger having Full Boiler Output. We urge you to contact your nearest agent or our factory for further information.

RITE ENGINEERING AND MANUFACTURING CORPORATION
144 South Mission Road Los Angeles 33, California

INDUSTRY

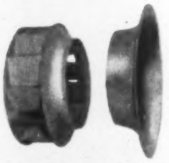
Breathes Easier

with

GENERAL

mechanical lungs!

Shown here is a "General" backward blade centrifugal fan. Highly flexible in purpose or position it is designed for use in heating-ventilating and air conditioning systems, power plant installations and industrial processes. Non-overloading, quiet operation are inherent qualities in all General backward blade fans.



BACKWARD BLADE WHEEL AND SPUN INLET.

Greater efficiency, longer life, less maintenance cost are automatically yours in every General Blower product. Over twenty years experience in manufacturing heavy duty air moving equipment for the nation's leading industries is the guarantee of quality behind each blower leaving our plant.

Let General Blower engineering "know how" help you with your next air handling problem. Contact the engineering sales representative in your area or write General Blower Company.

CERTIFIED RATINGS

AUTHORIZED BY NAFM

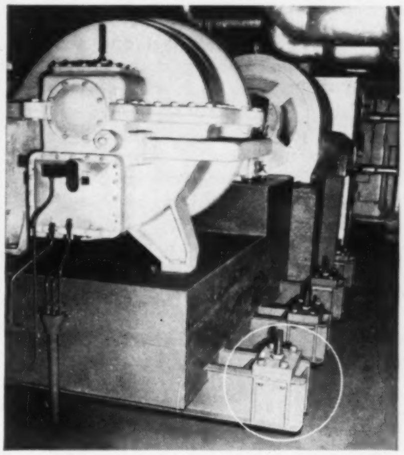
GENERAL BLOWER COMPANY

8602 FERRIS AVENUE
MORTON GROVE, ILLINOIS

In this "Drive-In" Office Building

KORFUND VIBRATION CONTROL *allows more rentable space*

A feature of the Cafritz Building in Washington, D. C., makes it possible to drive your car up a series of ramps, and park it outside your office door.



The Cafritz Building, *Washington, D. C.*
LeRoy L. Weiner *Architect*
William A. Brown *Consulting Engineer*
Cafritz Construction Company *Builder*
Mehring & Hanson Company *Mechanical Contractors*

Another feature is this 530 Ton Centrifugal Refrigeration Machine installed on the roof. Korfund Steel Spring Vibro-Isolators with adjustable leveling bolts (a Korfund feature for over 30 years) made this installation possible, since they completely prevent vibration and noise transmission even to floors directly below. This makes available more revenue-producing space elsewhere in the building.

This is just one of hundreds of successful upper floor installations of heavy air conditioning equipment on Korfund spring isolators. Only Korfund Vibro-Isolators allow really heavy upper floor installations without floor reinforcement and with positive assurance of vibration and noise control.

Utilize all possible revenue producing space — move air conditioning equipment upstairs. Korfund experience makes it possible. There is no substitute for experience.

For more information, write for your copy of Bulletin 23, or see our catalog in Sweet's Files.

See us at
Booth 548
Air Conditioning Show
Philadelphia
January 24-28

For specific recommendations, contact us or your local Korfund Office. Look under "Korfund" in your local Telephone Directory or Thomas' Register. A half-century of experience is at your disposal.

THE KORFUND CO., INC.

KORFUND VIBRATION CONTROL — SPRINGS — RUBBER — CORK

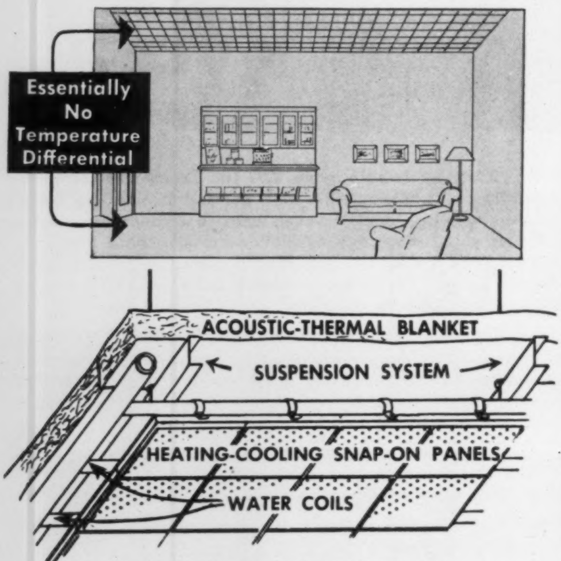
48-01F Thirty Second Place, Long Island City 1, N.Y.
In Canada: 510 Canal Bank, Ville St. Pierre, Montreal

How well informed are you about the . . .

BURGESS-MANNING 3-Way Radiant Panel Functional Ceiling?

Your clients will be asking!

Yes — word is getting around, as it will when something really good makes its appearance. Here is the most modern, efficient and economical method of heating, cooling and acoustic control ever devised — it's easy to layout, easy to install and competitive in cost. No other method can provide the same uniformity of temperature with essentially no differential from floor to ceiling. It has never been done before. The Burgess-Manning 3-Way Radiant Panel Functional Ceiling is completely self-contained — suspended construction and fully automatic. Know the facts and be prepared to recommend and specify the method that offers a new versatility and substantial savings in space, material and fuel.


Essentially No Temperature Differential
ACOUSTIC-THERMAL BLANKET
SUSPENSION SYSTEM
HEATING-COOLING SNAP-ON PANELS
WATER COILS

Write for Bulletin A-129-H

Architectural Products Division of
BURGESS-MANNING COMPANY
5970 Northwest Highway, Chicago 31, Ill.

Manufacturers of 3-Way Functional Ceilings and Telephone Acousti-Booths

struction of process plants and process units; design and/or fabrication of special processing equipment; corrugated type expansion joints, both directed flexing self-equalizing and nonequalizing; and vapor compression stills for purifying water in production volumes. Badger Mfg. Co., 230 Bent St., Cambridge 41, Mass.

▶ *SPINNING GAS FOR BOILER HEAT TRANSFER*—A bulletin contains information on the manufacturer's automatic boilers which use a spinning gas technique for the transfer of heat. Continental Automatic Boilers, Boiler Engineering & Supply Co., Inc., Phoenixville, Pa.

▶ *STAINLESS STEEL GATE VALVES*—In addition to schematic drawings of the manufacturer's line of valves, bulletin 55G includes a section on design factors, a discussion of construction materials, standards, and quality control measures.

Newscast, the manufacturer's periodical, contains in a recent issue *The Newer Cast Stainless Alloys*, in addition to other technical articles. Cooper Alloy Corp., Hillside, N. J.

▶ *STEAM AND AIR TRAP BULLETIN*—Bulletin 5415 is a 4 page, illustrated catalog emphasizing the design simplicity and low maintenance requirements of the manufacturer's steam and air traps. The C. E. Squires Co., 18502 Syracuse Ave., Cleveland 10.

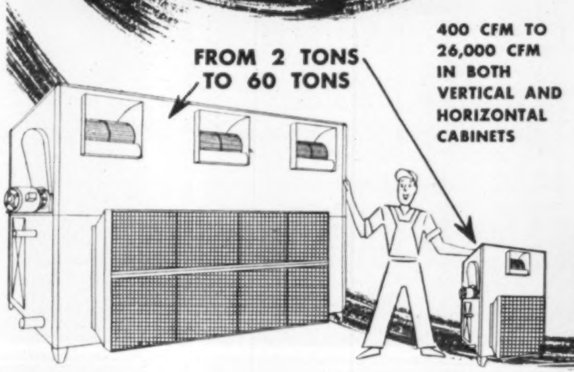
▶ *STORY OF DRAFT*—What draft is, what causes it to vary, why bother about it, and how it is controlled are described in the manufacturer's six page, pocket sized folder. Windmaster Corp., P.O. Box 776, Columbus 16.

▶ *TIME PATTERN TRANSMITTERS*—Bulletin 287-1 lists specifications of the manufacturer's pneumatic time pattern transmitter unit, an instrument designed to position the set point indices of one or more instruments to a definite time pattern. Minneapolis-Honeywell Regulator Co., Wayne & Windrim Ave., Philadelphia 44.

▶ *TRADE CATALOG*—Products and prices for the heating trade with selected accessories for the air conditioning, industrial ventilating, welding, building and allied trades are included in a new 160 page 1954-55 catalog. A. R. Webber Co., 424 Howard Ave., New Haven, Conn.

AIR HANDLING UNITS

24 DIFFERENT SIZES FOR PIN-POINT SELECTION


FROM 2 TONS TO 60 TONS
400 CFM TO 26,000 CFM IN BOTH VERTICAL AND HORIZONTAL CABINETS

COMPLETE FLEXIBILITY FOR YOU

Choose exactly what you want with Governair Air Handling Units. Secure more closely controlled balance of system load by simple selection of air handling component. 24 complete and individual sizes for greater flexibility.

OPTIONAL GOVERNAIR FEATURES:

- **Heavy-duty die formed face and by-pass dampers**
- **Generously sized permanent and replaceable filter sections**
- **Mixing boxes**
- **Spray and pan type humidifiers**

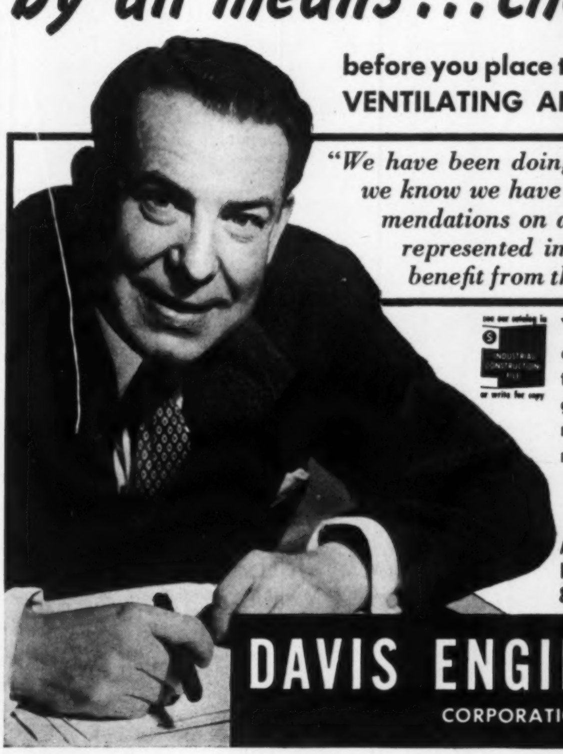
Manufacturers of Multi-zoned Air Handling Units, Packaged Air Conditioners, Evaporative Condensers, Cooling Towers, Blast Coils, and many others. Write for complete information and specifications.

GOVERNAIR

GOVERNAIR CORPORATION • 513 N. Blackwelder
Oklahoma City, Okla.

By all means... check with Paracoil

before you place that order for INDUSTRIAL HEATING, COOLING, VENTILATING AND PROCESS HEAT EXCHANGER EQUIPMENT



> *"We have been doing just that for over a quarter of a century—and we know we have saved ourselves thousands by taking their recommendations on any problem involving heat exchangers. They are represented in all principal trading areas, too, so you also can benefit from their experience, just as we have through the years."*

see our catalog in
INDUSTRIAL CONSTRUCTION FILE
or write for copy

You are so correct, Mr. PARACOIL CUSTOMER. Whenever well designed and well built heat exchangers — adequately engineered to give customer satisfaction year after year — are being investigated, the smart buyer has always preferred PARACOIL equipment! They always have had that *extra something* that made them more than just an assembly of tubes inside of a shell!

Paracoil Heat Exchangers for the heating, piping and air conditioning contractor include:

AIR HEATERS & COOLERS • CONDENSATE COOLERS • CONVERTORS • FUEL OIL HEATERS INSTANTANEOUS WATER HEATERS • LAUNDRY HEAT RECLAIMERS • LUBE OIL HEATERS & COOLERS • TANK STORAGE TYPE WATER HEATERS • WASTE HEAT EXCHANGERS

DAVIS ENGINEERING
CORPORATION

1064 East Grand St., Elizabeth, New Jersey
30 Rockefeller Plaza, New York 20, N. Y.

Write for catalog information

▶ *UNDERFLOOR DUCT MATERIAL*—An illustrated four page bulletin describes installation details and specifications for "Ceramiduct," a clay product for perimeter and radial underfloor slab heating duct systems. Straitsville Brick Co., New Straitsville, Ohio.

▶ *VALVES*—A 16 page bulletin covering a line of standard 4-way hand, foot, power and solenoid operated valves gives dimensions and weights, application and circuit diagrams, and parts list and accessories. Ledeen Mfg. Co., 1600 S. San Pedro St., Los Angeles 15.

▶ *VARIABLE SPEED DRIVE*—Bulletin 497 describes a new single wide range belt variable speed drive and shows how to design and select drives for 1 to 20 hp motors. Dimensions and prices are included. T. B. Wood's Sons Co., 1275 Fifth Ave., Chambersburg, Pa.

▶ *VISCOMETER*—A new eight page brochure illustrates the application of a Swiss made viscometer to both laboratory and in-plant process and quality control. Drage Products, Inc., 406 32nd St., Union City, N. J.

▶ *WATER CONDITIONING SPECIALTIES*—A four page bulletin covers water conditioning equipment and specialties including demineralizers, hot process, hot lime zeolite, zeolite softeners, reactors, deaerators, dealkalizers, filters, continuous blowoff systems, valves, separators and purifiers. Cochrane Corp., 3131 N. 17th St., Philadelphia 32.

▶ *WELDING PROBLEMS*—An eight page illustrated booklet on how to overcome welding problems and improve techniques discusses typical problems and their solutions. Eutectic Welding Alloys Corp., 40-40 172nd St., Flushing, N. Y.

▶ *WELDING PROCEDURES*—*Preheating for Welding*, a reprint of an article by A. B. Tesman, reviews welding procedures which have been found to produce crack free joints under a variety of conditions. Tempil Corp., 132 W. 22nd St., New York 11.

▶ *WELD INSERT*—Specifications and application procedures for the "EB" weld insert, a pipe joining electrode, are given in the manufacturer's new bulletin. Arcos Corp., 1500 S. 50th St., Philadelphia 43.

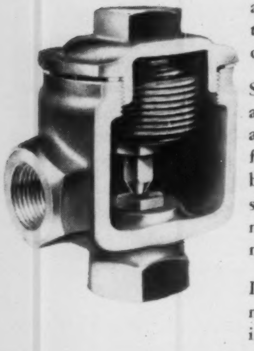
STERLING
THERMOSTATIC TRAPS
. . . MAXIMUM CAPACITY WITH MINIMUM MAINTENANCE!

That's the whole story on STERLING traps, and it's the best one yet to adequately describe the importance of the proper trap to good, efficient steam processing.

STERLING traps are made of bronze in ½" and ¾" size, for pressures from 0# to 200#, and with a full effective area of a large orifice for air removal *Minimum* maintenance is a built-in feature on STERLING Traps, but should it be necessary the bellows is easily removed with a conventional ⅝" hex wrench .... no special spanner is needed!

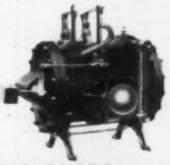
It will pay well to investigate this superior trap more thoroughly and we will gladly send more information on request.

STERLING ENGINEERING & MANUFACTURING CORP.
114 BUSINESS ST., HYDE PARK 36, BOSTON, MASS.

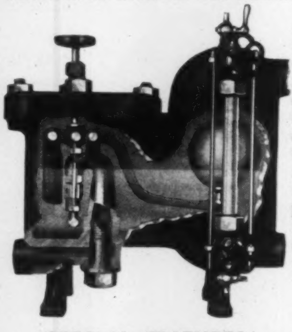


Do you have information on these popular STERLING items?

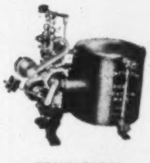
LIFTING AND VACUUM PUMPING MACHINES
A simple but effective method for handling hot returns at any temperature. Noiseless operation. May be had with receivers.



REGULAR STEAM SEPARATING TRAPS . . .
A complete line of standard and special design traps for positive, economical operation. They are float-operated and in addition to regular use have greater flexibility for installations requiring wide pressure fluctuations. Will operate on varying pressures, zero to orifice limit.



SPECIAL FEATURES
Stainless Steel Valves and Reversible seats. Gauge glass assembly manual By-pass. Interior removable without breaking pipe line. Permanent water seal prevents steam leaks. No air binding. No dirt clogging.



TEMPLETON BROTHERS MODEL

WHITLOCK

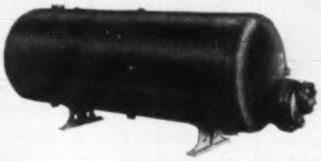
HEATING AND COOLING

Equipment

✓ **INSTANTANEOUS HEATERS**

For use where hot water at a nearly uniform rate is desired. Type R shown has a removable U-tube bundle; other designs are available. Write for Bulletin 20A. Write for details on stock heaters.

✓ **STORAGE HEATERS**



Type K Storage heaters supply ample hot water at all times. Whitlock-Everdur construction assures lifetime service: Also made in Eterno and Standard Steel. See Bulletin 40A. Write for details on stock heaters.

✓ **FUEL OIL HEATERS**

Preheating promotes efficient atomization and burning. Type V-1 Heater shown is easily cleaned without breaking line connections. Whitlock heaters are made in a wide range of types and sizes. Ask for Bulletin 35.

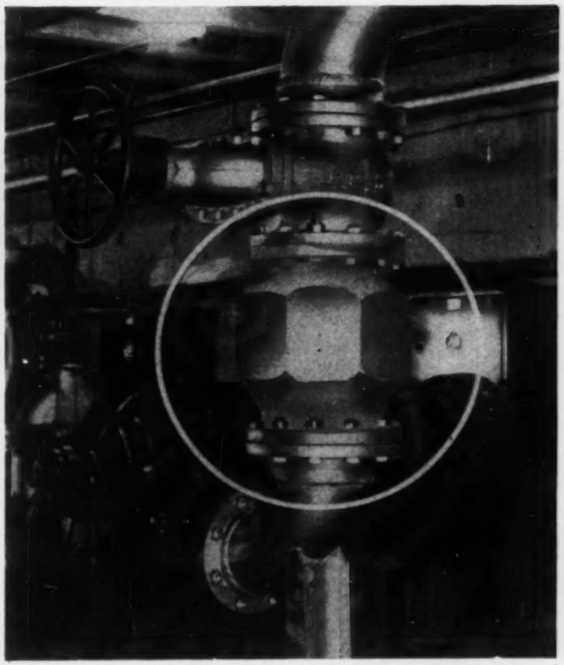
✓ **WATER CHILLERS**

For Air Conditioning service Whitlock chillers are built to meet specific job requirements. The dry expansion cooler illustrated is of U-bend design; refrigerant passes through the tubes and cools water in shell — thus less refrigerant is required and danger of freeze-ups is greatly reduced. Ask for recommendations. Write for Bulletin 140.

Whitlock Engineering Service is complete — Bring your heating or cooling problems to us.

THE WHITLOCK MANUFACTURING CO.

44 SOUTH STREET
HARTFORD 10, CONN.
NEW YORK · BOSTON · CHICAGO
PHILADELPHIA · DETROIT · RICHMOND
Authorized Representatives in Other Principal Cities
IN CANADA: DARLING BROTHERS, LTD., MONTREAL



10" MILLER VALVE INSTALLED IN MIDWESTERN DEPARTMENT STORE

MILLER

NOISELESS — NON-SLAM
CENTER GUIDED CHECK VALVE

SHOCK-PROOF
ELIMINATES WATER HAMMER

FULL RADIAL FLOW
MINIMUM PRESSURE LOSS
SIZES 1" THROUGH 24" FLANGED
SEMI-STEEL — CAST STEEL — ALLOYS
PRESSURES 125 LBS. TO 2500 LBS.

YOU CAN DEPEND ON A
MILLER CHECK VALVE
IT IS THE **BEST**

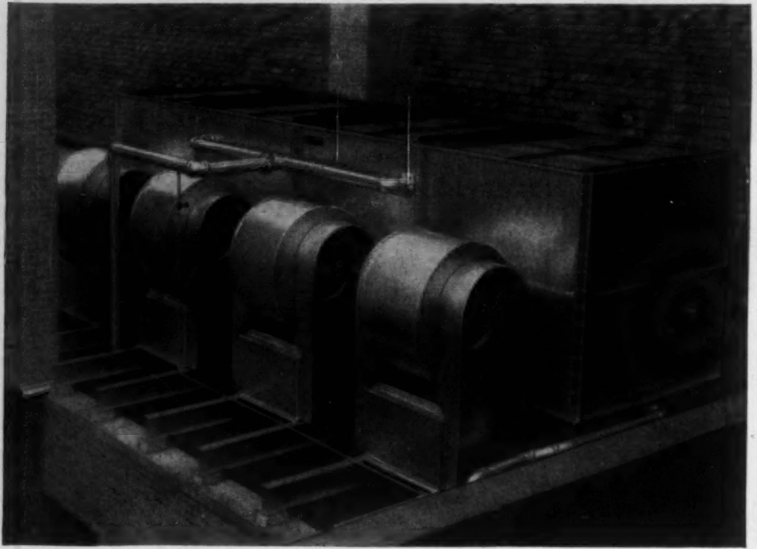
VISIT BOOTH 320 AT THE AIR CONDITIONING EXPOSITION . . . PHILADELPHIA

MILLER VALVE CO., INC.
P.O. BOX 1255
PITTSBURGH 30, PENNA.

Please send your Bulletin 153 Descriptive of Miller Shock Proof Center Guided Check Valves.

NAME AND TITLE ....
FIRM NAME ....
ADDRESS ....
CITY ....

COOLING TOWER NEWS



This Binks Series 3-B forced draft cooling tower provides more than ample cooling for the 160 tons of air conditioning needed for this university chapel...and does it extremely quietly.

Quietness and compactness win contract for Binks Cooling Tower

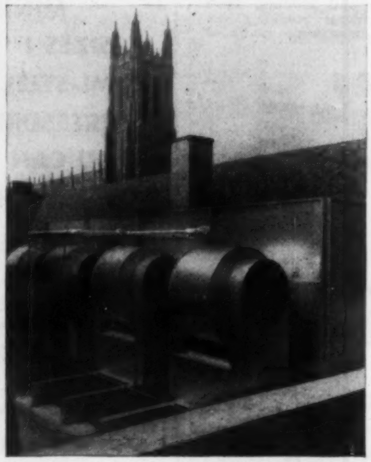
Leading Southern University picks Series 3-B Tower for chapel roof.

These modern forced draft, low silhouette, cooling towers featuring the dry blower air propulsion system, are designed for use where high cooling efficiency is demanded, combined with whisper-quiet performance and compactness. Squirrel cage blowers supply ample air movement at tip speeds far less than the usual noisy propeller-type fans.

High cooling efficiency is obtained due to thorough water break-up from Binks patented Rotojet nozzles, combined with internal redwood nailless decking. They also feature counter-current operation with air movement in opposite direction to downward water flow.

Heavily galvanized, these towers reduce maintenance to a minimum. Interior surfaces are fully sprayed with a tough mastic coating. The air propulsion assembly is located in the dry air stream to protect it from corrosion. Series 3-B towers are completely shop fabricated, ready for easy assembly.

FOR FULL INFORMATION write for Bulletin 477...or see us in Booth 236 at the Air Conditioning Exposition in Philadelphia, January 24 thru 28.



The compact design and low silhouette of this tower keeps it out of sight from street level.

BINKS MANUFACTURING CO. 3118-38 Carroll Ave., Chicago 12, Ill.

REPRESENTATIVES IN PRINCIPAL U. S. & CANADIAN CITIES • SEE YOUR CLASSIFIED ☎ DIRECTORY

RECENT TRADE LITERATURE

Continued

▶ *PRODUCT BULLETIN*—The manufacturer's new two color bulletin contains information on damper regulators, quadrants, damper quadrants, vane-rail, flexible duct connectors, damper hardware, blade kits, file and solder iron handles, portable spot welders with accessory equipment, and metal punches. Duro-Dyne Corp., 800 Third Ave., New Hyde Park, N.Y.

▶ *FLEXIBLE COUPLINGS*—A pocket sized booklet contains technical data and ratings, drawings, specifications, service factors, plus information on various uses of the manufacturer's rubber-bronze bushed flexible couplings. Ajax Flexible Coupling Co., Inc., Westfield, N. Y.

▶ *SYSTEM-ENGINEERED COMPONENTS*—"Small tonnage" condensers, both shell and tube and shell and coil types, 3 to 150 ton heat exchangers and liquid receivers, and a range of water coolers are the subject of a new 4 page catalog. Data for selecting the proper units is given along with brief descriptions of all major construction features. Acme Industries, Inc., Jackson, Mich.

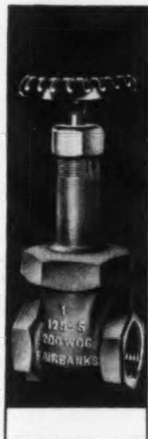
▶ *FLEXIBLE CONTROLS*—A 12 page, two color brochure illustrates various types of the manufacturer's "Tru-Lay Push-Pull" controls and their applications. Automotive & Aircraft Div., American Chain & Cable Co., Inc., 601 Stephenson Bldg., Detroit 2.

▶ *REGISTERS AND GRILLES*—"Vane-O-Line," the manufacturer's strip supply grille, is presented in a large folded leaflet from the company. Engineering data is included. The Louvra Corp., 1010 Jeanette Ave., Union, N.J.

▶ *RADIANT BASEBOARD HEATING*—Illustrated, step-by-step instructions and methods for calculating heat loss and for planning and laying out heating installations, are contained in the manufacturer's 42 page manual. Crane Co., 836 S. Michigan Ave., Chicago 5.

Fairbanks

UNION BONNET GATE VALVES



125 lb.

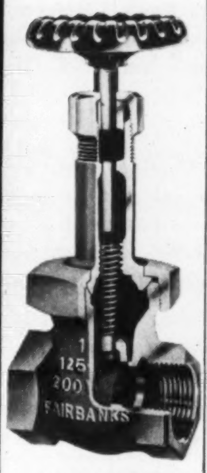


FIGURE U-0252
Rising Stem. Solid Wedge. Taper Seat. 125 Pounds Steam Working Pressure. 200 Pounds Cold Water, Oil or Gas Pressure. Non-Shock.

150 lb.

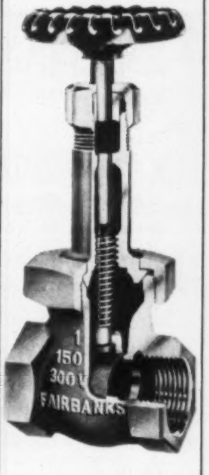


FIGURE U-0226
Rising Stem. Solid Wedge. Taper Seat. 150 Pounds Steam Working Pressure. 300 Pounds Cold Water, Oil or Gas Pressure. Non-Shock.

Two-Piece Union Bonnet Construction For Extra Easy Assembly And Disassembly

Two-piece **Radial Seat** Union Bonnet Construction provides extra easy assembly, long service, dependability that gives you extra value. **Radial Seat** provides line contact through accurately machined true ball and socket mating surfaces, for leakproof body bonnet joint. Two-piece construction eliminates sliding or scraping — prevents scoring — of body and bonnet mating surfaces during assembly and insures even contact pressure for perfect alignment of working parts. Heavy union nut will not deform under pressure and protects body and bonnet from distortion. Valves may be repacked under pressure when wide open—top seat above threads—out of line of flow—is protected against deposits and excessive wear.

SERVICE: Recommended for general service on steam, water, gas, and oil lines where full, unrestricted flow is desired. Valves give long trouble-free operation.

YOURS ON REQUEST: Colorful, illustrated brochure fully describes Fairbanks Bronze Gate Valves with Union Bonnet Construction, complete with specifications and details. Write for your free copy today.

Order Fairbanks products through your local distributor who is always happy to serve you.

THE **Fairbanks** COMPANY
393 LAFAYETTE STREET, NEW YORK 3, NEW YORK
BRANCHES: NEW YORK 3 • BOSTON 10
PITTSBURGH 22 • ROME, GEORGIA
Trucks • Valves • Casters • Wheels • Dart & "Pic" Unions

PYPON

MANUFACTURERS OF STAINLESS PIPE TUBING AND WELDING FITTINGS

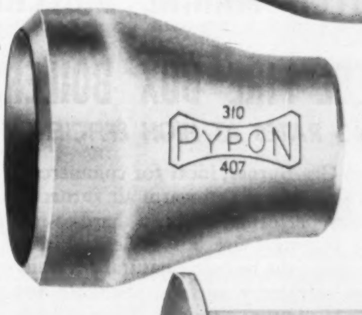
A business built on the ability to serve the requirements of piping engineers and contractors and growing because of that service, performed on time.

347
PYPON
272

◀◀◀
**90° Elbow
NOMINAL PIPE
SIZES ½" to 24"**

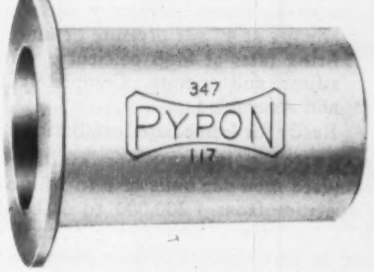
**Caps ▶▶▶
½" to 24"**

304
PYPON
465



◀◀◀
**Reducers
1" to 12"**

▶▶▶
**Stub End
½" to 24"**



All fittings made in schedules 10, 40, 80, 160.

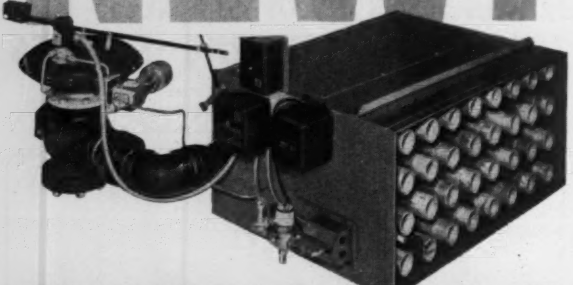
Available in stainless types 304, 304-L, 316, 316-L, 347.

SEND FOR CATALOG 53

The PYPON *Company*

FRICK BUILDING **PITTSBURGH, PA.**

NEW!



MULTURI
(Multiple Venturi)
GAS BURNER

Especially designed for . . .
HARD-TO-FIRE
● SCOTCH MARINE BOILERS
HARD-TO-FIRE
● STEEL FIRE BOX BOILERS
AT HIGH FIRING RATES AT HIGH EFFICIENCY!

A Premix Type Gas Burner, ideal for commercial and industrial size boilers and warm air furnaces. Gives maximum performance from hard-to-fire Scotch Marine and steel fire box boilers. Flame characteristics make the burner a natural for units with extensive refractory surface. Suitable for any gas at 4" gas pressure or more. Permits high firing rates at high efficiency. Simple to install, adjust, and operate. Completely Factory Wired and Assembled . . .
Ready for Immediate Installation!

MULTURI BURNERS are available in standard modular units of 6 to 54 mixers. Capacities from 1,200,000 to 10,800,000 BTU/hr. Special units of higher capacities can be furnished. *Write or phone us for detailed information.*

Also Available — Nordensson Power Burners and Combination Gas-Oil Burners.

ROBERTS-GORDON APPLIANCE CORP.
DEPARTMENT HPAC • BUFFALO 6, N. Y.
Conversion Gas Burners • Gas Heating Equipment

WHO'S WHAT . . .

(New personnel, promotions)

▶ *NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSN.*—Elected officers: Gilbert W. Denges, president; Frank L. Meyer, 1st vice president; Tom I. Byrd, 2nd vice president. Elected to the board of trustees are: T. W. McNeill and J. F. Knoff.

▶ *METROPOLITAN REFINING CO.*—Frederick S. Hodgdon, associate chief engineer for all problems pertaining to water treatment in air conditioning and allied equipment. Mr. Hodgdon was most recently associated with Carrier Corp. in a similar capacity.

▶ *AVERY ENGINEERING CO.*—Fred Kohloss, chief engineer. Mr. Kohloss' duties will include supervision of the design, purchase and construction of central station air conditioning in northern Ohio for the company.

▶ *KULJIAN CORP.*—William J. Fadden, Jr., chief mechanical engineer. Mr. Fadden will supervise mechanical phases of Kuljian engineering and construction projects in this country and abroad.

▶ *BAL-AIR, INC.*—James E. Hailey, national sales manager for air conditioning equipment.

▶ *INGERSOLL PRODUCTS DIV. of BORG-WARNER CORP.*—J. H. Ingersoll, president and general manager of each of the division's three new separate manufacturing and sales operations. He succeeds R. S. Ingersoll, who will now devote full time to his duties as administrative vice president of Borg-Warner. Two of the three new divisions, the Ingersoll Kalamazoo Div. and the Ingersoll Conditioned Air Div., both located at Kalamazoo, are managed by Robert F. Schutz and F. S. Gombert, respectively. The third unit, located in Chicago, will retain the name of the Ingersoll Products Div.

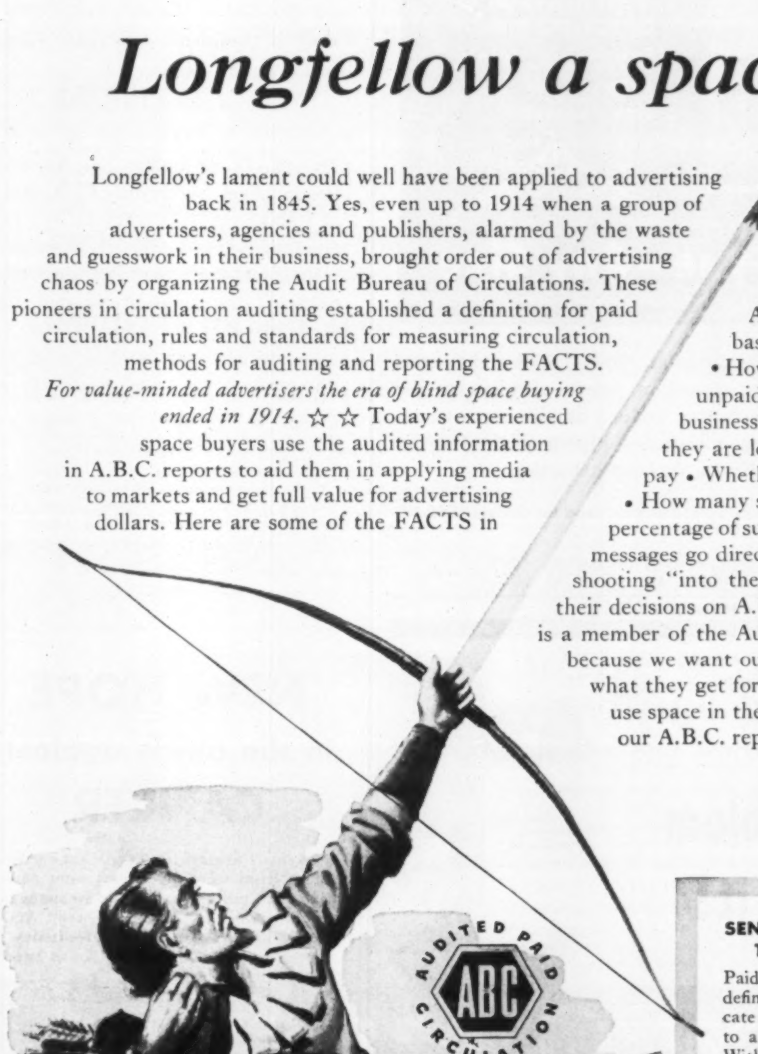
▶ *ARMSTRONG CORK CO.*—M. J. Warnock, additional responsibility as vice president for coordinating and strengthening the company's public and employee relations activities, in addition to the overall direction of Armstrong's financial affairs; Walter E. Hoadley, Jr., treasurer, succeeding Mr. Warnock. Mr. Hoadley will continue as company economist and manager of commercial research.

▶ *BAILEY METER CO.*—C. D. Shanks, resident engineer, with headquarters in Charleston, W. Va.

"I shot an arrow into the air,
It fell to earth, I know not where."

The Arrow and the Song—Longfellow, 1845

Longfellow a space buyer?



Longfellow's lament could well have been applied to advertising back in 1845. Yes, even up to 1914 when a group of advertisers, agencies and publishers, alarmed by the waste and guesswork in their business, brought order out of advertising chaos by organizing the Audit Bureau of Circulations. These pioneers in circulation auditing established a definition for paid circulation, rules and standards for measuring circulation, methods for auditing and reporting the FACTS. *For value-minded advertisers the era of blind space buying ended in 1914.* ☆ ☆ Today's experienced space buyers use the audited information in A.B.C. reports to aid them in applying media to markets and get full value for advertising dollars. Here are some of the FACTS in A.B.C. reports that provide a sound basis for advertising investments: • How much paid circulation • How much unpaid distribution • Occupational or business breakdown of subscribers • Where they are located • How much subscribers pay • Whether or not premiums are used • How many subscribers in arrears • What percentage of subscribers renew. ☆ ☆ Sales messages go direct to their targets, there's no shooting "into the air" when space buyers base their decisions on A.B.C. FACTS. This publication is a member of the Audit Bureau of Circulations because we want our advertisers to know what they get for their money when they use space in these pages. Ask for a copy of our A.B.C. report and then study it.

SEND THE RIGHT MESSAGE TO THE RIGHT PEOPLE

Paid subscriptions and renewals, as defined by A.B.C. standards, indicate an audience that has responded to a publication's editorial appeal. With the interests of readers thus identified, it becomes possible to reach specialized groups effectively with specialized advertising appeals.

A.B.C. REPORTS—FACTS AS A BASIC MEASURE OF ADVERTISING VALUE

LA FAVORITE Expansion Joints

A typical grouping of the thousands of La Favorite Rubber Expansion Joints supplied for U. S. Navy vessels.
1 of 10,000 La Favorite Products
Any Type—Any Size

Round, Square, Rectangular, Oval, Taper and Special Shapes of rubber expansion joints compensate for linear expansion in piping; absorb vibration; reduce or eliminate transmission of undesirable noise; or connect misaligned piping without strain on the line—for years of economical service without attention.

For complete details, send for Bulletin 259-W.

LA FAVORITE RUBBER MFG. CO.
3234
256 Wagaraw Road • Hawthorne, N. J.
RUBBER LININGS • RUBBER COVERING • RUBBER ENGINEERING

See us at Booth S-24 at the International Heating and Ventilating Exposition in Philadelphia

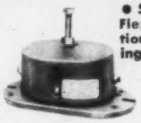
if you have a VIBRATION problem VM can solve it!

VM Vibration Engineers are experts in finding the *right* solution to shock and vibration transmission problems. Their skill, and VM's complete selection of mountings can increase your operation efficiency and save equipment and floors. Ask a VM representative to call or submit your problems to our home office.

Specialists in vibration isolation for:
FANS & MOTORS
REFRIGERATING COMPRESSORS
PUMPS • BOILERS
AIR CONDITIONING UNITS
SUSPENDED EQUIPMENT • PIPING
SHEARS-PRESSES-BRAKES

See our Catalog in Sweet's files or write for Engineering Bulletin #G55

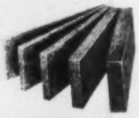
If it's a vibration or shock problem get the right answer — quick — from



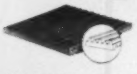
• Spring-Flex Vibration Mountings

• Vibration Hangers (Rubber)

• Vibration Hangers (Spring)

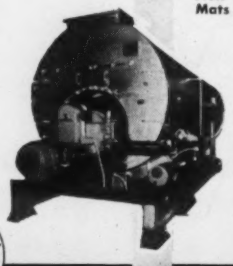


• Cork-Flex Mats



• Shear-Flex Pads

Other products available: Rubber-in-Shear Mountings, Integral Fan and Motor Vibration Bases Flexible Hose



VIBRATION MOUNTINGS, INC.
76-35 Queens Blvd., Elmhurst, L. I., New York

WHO'S WHAT

Continued

▶ *NATIONAL ASSOCIATION OF MANUFACTURERS*—J. H. Devor, a regional vice president in the midwest division of the association. Mr. Devor is president of Wagner Electric Corp., St. Louis.

▶ *JOSEPH T. RYERSON & SON, INC.*—C. D. D'Amico, Los Angeles sales manager, succeeding C. H. Hallett who moves to Chicago for special assignment; F. X. Kinzie, manager of the company's stainless steel department, the position vacated by Mr. D'Amico.

▶ *BABCOCK & WILCOX CO.*—George W. Kessler, chief engineer of the company's boiler division.

▶ *AMERICAN INSTRUMENT CO., INC.*—Norman R. Miller, to the company's environmental group.

NEW HOPE
in the battle against
CANCER

THE FIGHT against man's cruelest enemy is far from won. If present rates continue, 23 million living Americans will die of cancer—230,000 *this year*. And thousands of these will die needlessly—through cancer that could have been cured if treated in time.

ALL THE SAME, there have been victories. Thousands who once would have died are being saved—thanks, in part, to *your* donations to the American Cancer Society.

AND, LAST YEAR, the Society was able to allocate $5,000,000 of your donations to research aimed at finding the ultimate cure for *all* cancer. That's more money than ever before.

MUCH MORE, of course, remains to be done. So please make *this* year's gift a really *generous* one!

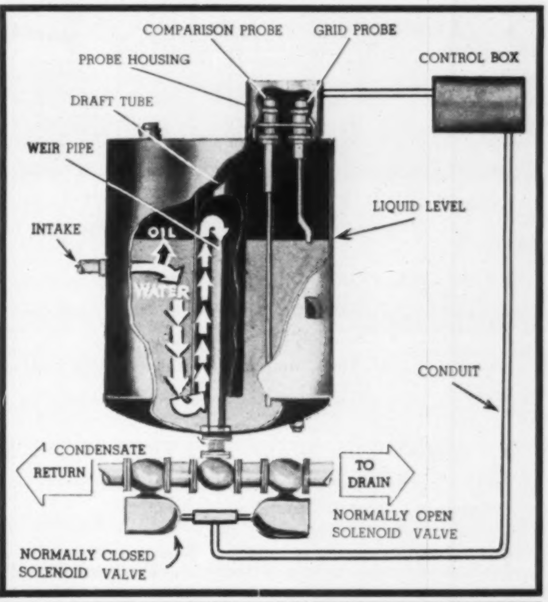
Cancer
MAN'S CRUELEST ENEMY
Strike back—Give
AMERICAN CANCER SOCIETY

Eliminate **SHUT DOWN** *time*

due to SCALING, FOULING, or OIL EXPLOSION in boilers using preheated fuel oil

install . . .

TECHNIFLEX AUTOMATIC OIL SLICK SEPARATOR AND DETECTION SYSTEM

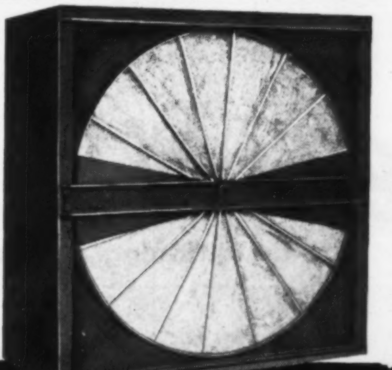

COMPARISON PROBE
GRID PROBE
PROBE HOUSING
CONTROL BOX
DRAFT TUBE
WEIR PIPE
LIQUID LEVEL
INTAKE
OIL
WATER
CONDUIT
CONDENSATE
RETURN
TO DRAIN
NORMALLY OPEN SOLENOID VALVE
NORMALLY CLOSED SOLENOID VALVE

SENSITIVE TO OIL SLICK DEPTH OF 1/16"

Don't take chances with an expensive boiler . . . and there's no need either to incur extra maintenance because of fouling and scaling. The sure solution to these problems is the installation of the superior alarm system shown at right which will enable you to prevent oil explosions due to oil contaminated condensates, reduce scaling, eliminate fouling and economize on makeup water.

Units furnished complete with oil trap and detection system. Further inquiry is invited, and we'll gladly supply additional details, if you'll but write us today.

TECHNIFLEX CORPORATION **PORT JERVIS, N. Y.**



HOLD DOWN COSTS FOR HEATING OR COOLING AIR

SUMMER AND WINTER APPLICATION

The THERM-O-WHEEL will return HEAT that is normally lost through ventilation and process exhaust ducts by transferring this heat to the cold incoming fresh air stream.

***In cooling air* the THERM-O-WHEEL will remove HEAT from the warm incoming fresh air stream by transferring this heat to the cooler, contaminated, exhaust stream.**

REDUCE COSTS

Increase ventilation load without increasing size of existing boilers. In new construction save on initial investment for heating and cooling equipment.

Save fuel costs by using the air you throw away.

THERM·O·WHEEL

A ROTARY AIR HEAT EXCHANGER

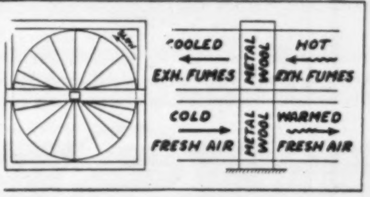
HOW IT WORKS

A cylinder fitted with radial partitions and filled with metal wool rotates in two separate air streams. In the diagram shown, hot fumes pass through the upper half of the wheel. The metal wool picks up the heat and holds it until this wool rotates to its lower position where the heat is transferred to the cold, fresh air stream. *The heat transfer is continuous.*

Thermowheels are available for capacities of from 3000 to 20,000 cfm.

WRITE FOR COMPLETE DETAILS

SOME TERRITORIES FOR DISTRIBUTORS STILL OPEN


COOLED EXH. FUMES
METAL WOOL
HOT EXH. FUMES
COLD FRESH AIR
METAL WOOL
WARMED FRESH AIR

THERM O WHEEL INCORPORATED

1040 BEACH 22ND STREET
FAR ROCKAWAY, N. Y.

WHO'S WHAT

Continued

▶ *EUTECTIC WELDING ALLOYS CORP.*—Joseph F. Quaas, director of manufacturing and production. Prior to this appointment, Mr. Quaas was manager of the company's Electrode Production Div.

▶ *VERTICAL TURBINE PUMP ASSN.*—Warren L. Bremer, president; William H. Reeves, vice president; B. A. Tucker, secretary-treasurer.

▶ *TYPHOON AIR CONDITIONING CO., INC.*—Jerome Bixby, publicity manager. In his newly created post, Mr. Bixby will work closely with Peter T. Wotton, the company's advertising and publicity director.

▶ *CARRIER CORP.*—Fred Williams, merchandising specialist for room air conditioners and automatic icemakers in Philadelphia district; Roy Lansing, assistant to L. M. Ross, manager of the Chicago district office.

▶ *YOUNGSTOWN SHEET AND TUBE CO.*—E. S. Steigner, supervisor of the newly organized service engineering department.

▶ *MODINE MFG. CO.*—Arthur G. Dixon, vice president in charge of engineering. In this capacity, Mr. Dixon will coordinate and direct the company's engineering activities.

▶ *STEWART-WARNER CORP.*—Alexander Kidd, a vice president of sales.

▶ *MINNEAPOLIS-HONEYWELL REGULATOR CO.*—Howard Snyder, manager of Milwaukee branch office.

▶ *WEINMAN PUMP MFG. CO.*—Harvey R. Ray, sales manager.

▶ *YORK CORP.*—C. A. Olsen, a director; Roger H. Dowling, assistant vice president of product quality. Mr. Olsen is president of the C. A. Olsen Mfg. Co., manufacturer of gas- and oil-fired furnaces.

▶ *TRANE CO.*—George P. Staats, assistant development engineer; Robert G. Weiske, an engineer in the research and testing laboratories.

▶ *HEIL PROCESS EQUIPMENT CORP.*—Edwin Vereeke, executive vice president. Mr. Vereeke has been with Heil since 1946, serving most recently as vice president in charge of sales.

WIREMOLD FLEXIBLE AIR DUCT

PROVED in the laboratory and on the job!

The Wiremold Company spent two years developing type 571A AIR DUCT before marketing it for flexible connections on high velocity air conditioning systems. All qualities including longevity, flame resistance, strength and durability were tested thoroughly.

WIREMOLD Flexible AIR DUCT has proved itself on the job by saving installation time and money. It is recommended by leading manufacturers of air distribution equipment and has been installed in many new commercial and industrial buildings.

The Wiremold combination of tested materials and exclusive construction make it best for the job. There is no glue or adhesive to break down because a specially coated Fibreglas is *mechanically locked* into the supporting steel spiral.

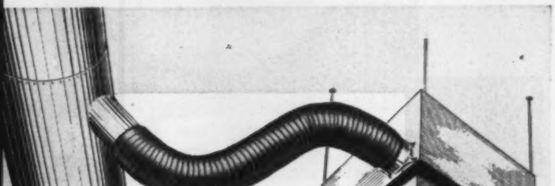
- Extremely flexible
- Light weight but sturdily constructed
- Takes all bends without kinking

- Excellent air flow characteristics
- Waterproof . . . flame resistant

Sizes from 3" to 10", Inside Dimensions

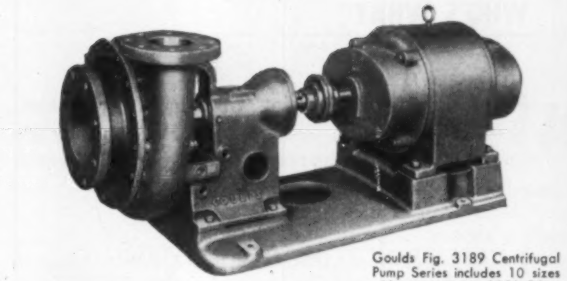
BEST for the job

. . . in Commercial Air Conditioning Applications!



Get the complete story on WIREMOLD Flexible AIR DUCT. Write for Data Sheet S-3.

The WIREMOLD Company
HARTFORD 10, CONNECTICUT



Goulds Fig. 3189 Centrifugal Pump Series includes 10 sizes with capacities to 1080 GPM; heads to 180 ft.

interesting facts

. . . about a new series of Goulds Multi-Purpose Centrifugal Pumps

Newest in a line of heavy-duty centrifugal pumps reputed for their dependable, trouble-free operation, the Goulds Fig. 3189 Series offers you:

Versatility

You can use the Fig. 3189 single-stage, open impeller pumps for general water service, irrigation, circulation, slurries, transfer, factory wastes and for air conditioning. You can choose just the right pump for your need from 10 sizes with capacities ranging up to 1080 gallons per minute, with heads up to 180 feet at 1750 RPM.

Economy

The Fig. 3189 Series is made in the Goulds tradition—they're built to work hard and to last long. Their design accommodates wide interchangeability of parts, greatly reducing parts inventory requirements where many pumps are used.

Low Operating Cost

Modern hydraulic design provides high operating efficiency with relatively low power consumption. Impellers are statically and hydraulically balanced for smooth operation.

Operating Convenience

You can adapt the Fig. 3189 pump to various piping arrangements by swiveling the discharge nozzle to any one of three positions.

Maintenance Convenience

Wide openings in the support head give ready access to gland and stuffing box. Bearing housing is completely sealed to exclude moisture and dirt. *You can safely use the unit outdoors without fear of dirt harming the bearings and you can hose it down without fear of water damage.*

For specifications, performance curves and other interesting design details that contribute to long, economical service, send for illustrated Bulletin 720.4.

Goulds PUMPS INC.
Seneca Falls
New York

ATLANTA • BOSTON • CHICAGO • HOUSTON • NEW YORK
PHILADELPHIA • PITTSBURGH • TULSA

NOW LOW COST AIR CONDITIONING FOR INDUSTRIAL HOT SPOTS!

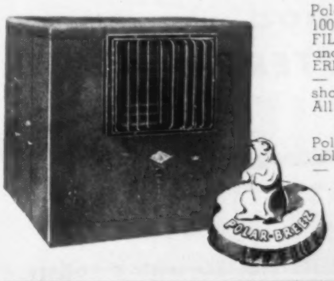
Mr. Harold Bender, General Manager of the Swiss Cleaners, Indianapolis, Indiana, says: "I have seen a temperature reading in my plant of 120° F. at the hot heads, and after turning on the "Polar Breez" units we had an 85° F. temperature of the air coming to the operator where he or she is working. That condition gives you the production that is necessary in extreme **HOT WEATHER.** A temperature drop of 30° F. gives you ideal employee relations and a much better QUALITY of work for happier customers."

Here's the "way out" for those really tough industrial "hot spots" where the equipment in use generates and intensifies the heat.

A Polar Breez unit, installed in a hot spot such as this, will drop the temperature a full 20° and more . . . and at a cost well within reach of every business.

For example a Polar Breez unit large enough to cool a room 60' long x 30' wide x 10' high costs your client less than $1000 COMPLETELY INSTALLED . . . operates at less than 5c an hour for electric, water cost $1.00 a year.

Polar Breez Units have been subjected to every conceivable sort of application . . . AND HAVE MET WITH APPROVAL EVERYWHERE. This is our proof — and YOURS — that you can't go wrong when you recommend, sell and install POLAR BREEZE AIR CONDITIONING.



Polar Breez units supply 100% FRESH — COOLED — FILTERED AIR At all times and are IDEAL For TAVERNS — small restaurants — drug stores — beauty shops — small stores and All Industrial HOT SPOTS.

Polar Breez units are available in sizes of 3 — 5 — 7½ — 10 — 15 and 25 ton equivalent capacity to meet all requirements.

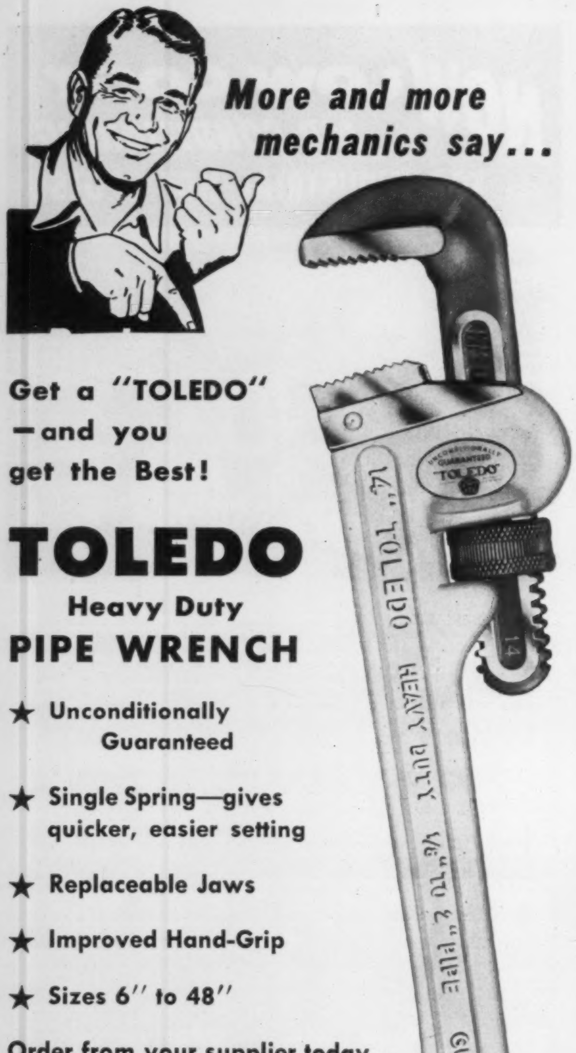
Territories open for Agents — Jobbers — Dealers.

GET THE FACTS TODAY!

Air Cooling Engineering Company
P.O. Box 744
Evanston, Illinois

Please send me complete details on "Polar Breez" Air Conditioning.

Name . . . .
Company . . . .
Address . . . .
City . . . . **Zone** . . . . **State** . . . .


14" TOLEDO HEAVY DUTY 1/8" TO 2" PIPE GUARANTEED
UNCONDITIONALLY GUARANTEED TOLEDO
14

More and more mechanics say...

Get a "TOLEDO" —and you get the Best!

TOLEDO
Heavy Duty
PIPE WRENCH

★ Unconditionally Guaranteed
★ Single Spring—gives quicker, easier setting
★ Replaceable Jaws
★ Improved Hand-Grip
★ Sizes 6" to 48"

Order from your supplier today.

Need a Good PIPE CUTTER?

1/8" to 2" pipe

Try the new TOLEDO No. 20 with 6 rollers—recommended for use with power drives—works fine by hand, too.

THE TOLEDO PIPE THREADING MACHINE CO.
Toledo 4, Ohio

"TOLEDO"
TRADE-MARK REGISTERED U.S. PAT. OFFICE

Builders of the World's Finest Pipe Tools

PIPE THREADERS
PIPE WRENCHES
POWER PIPE MACHINES

WHO'S WHAT

Continued

▶ *PERFEX CORP.*—Irving G. Bohrman, president; Ernest H. Panthofer, vice president. Mr. Bohrman fills the vacancy left by the resignation of Carroll E. Lewis, who had been president since 1946.

▶ *GREEN FUEL ECONOMIZER CO., INC.*—Kenneth B. Gair, vice president and general manager. Mr. Gair has been serving as vice president in charge of production and research since March, 1951.

▶ *EMERSON RADIO AND PHONOGRAPH CORP.*—Jules Alexandre, sales manager for air conditioning.

▶ *MARLOW PUMPS DIV. of BELL & GOSSETT CO.*—F. R. Paris, assistant sales manager. In addition to assisting A. F. Woods, sales manager, Mr. Paris will directly supervise all of the division's district engineers west of the Mississippi.

▶ *LAU BLOWER CO.*—T. I. Byrd, vice president in charge of sales; Harold Faulkender, vice president and general manager.

▶ *INSTRUMENT SOCIETY OF AMERICA*—William H. Kushnick, executive director, the top administrative post of the Society.

▶ *GENERAL CONTROLS CO.*—J. B. Griffith, assistant to J. F. Ray, vice president in charge of sales.

▶ *FLEXIBLE TUBING CORP.*—Carrol A. Peterson, project engineer for the company's research and development department.

IN THE TERRITORIES . . .

(Recent sales appointments)

▶ *INSUL-MASTIC CORP. OF AMERICA*—Runnels Paint Co, Pacific Northwest area, and Waugh-Morrison Co, eastern Tennessee and western Virginia, North Carolina district, distributors for protective coatings.

▶ *KSM PRODUCTS, INC.*—New sales representatives are: F. Kern, through District Steel, Inc., West Coast district; Mobile Welding Co., Mobile, southern Mississippi and eastern Louisiana. District engineers are: Donald C. Rolling, Detroit area; Claude Batuk, Chicago territory.

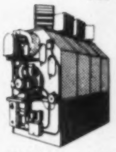
National Champion

HAS THE POINTS THAT WIN!

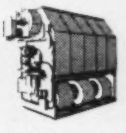
Get the jump on your heating problem with National Champion Heaters! Whatever your heating need — space heating, tempering, make-up air, curing, drying or de-icing — there's a National Champion to do the job. Check these winning points:

- 80% guaranteed heating efficiency
- Direct fired for gas, oil or combination fuels
- Completely automatic controls — for constant, clean heat
- 70%-150% more heat transfer area than similar units
- Quieter, smoother operation — lowest blower RPM
- Highest available external static pressures
- Electronic flame failure control
- Completely wired, assembled and flame-tested at the factory to guarantee peak performance
- Listing by Underwriters' Laboratories, Inc.

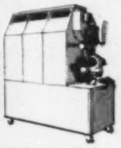
NATIONAL CHAMPION HEATERS— 6 Models — 66 Sizes



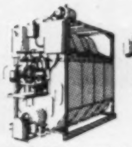
Model H — vertical unit with discharge heads. 12 sizes.



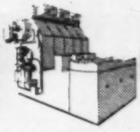
Model D — vertical unit for duct work. 12 sizes.



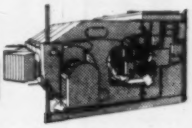
Model P — portable, vertical unit for flexible duty. 6 sizes.



Model R — inverted unit with discharge heads at bottom. 12 sizes.



Model S — vertical unit with side blowers to permit proper location of air mixing dampers. 12 sizes.



Model C—horizontal ceiling suspension unit for space saving. 12 sizes.

Teardrop design Combustion Chamber the "heart" of National Champions

Write today for complete information and specifications.

NATIONAL HEATER COMPANY, INC.
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ALL NEW FOR '55

SEE IT AT THE SHOW

Again . . . AQUA-SAVER scoops the industry! When you see the new models for 1955 unveiled at the 12th International Heating and Ventilating Exposition in Philadelphia, Jan. 24-28, you'll see that PEERLESS has done it again! We'll see you at the Show—Booth S-41

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Manufacturers of
AQUA-SAVER COOLING TOWERS
Offices in
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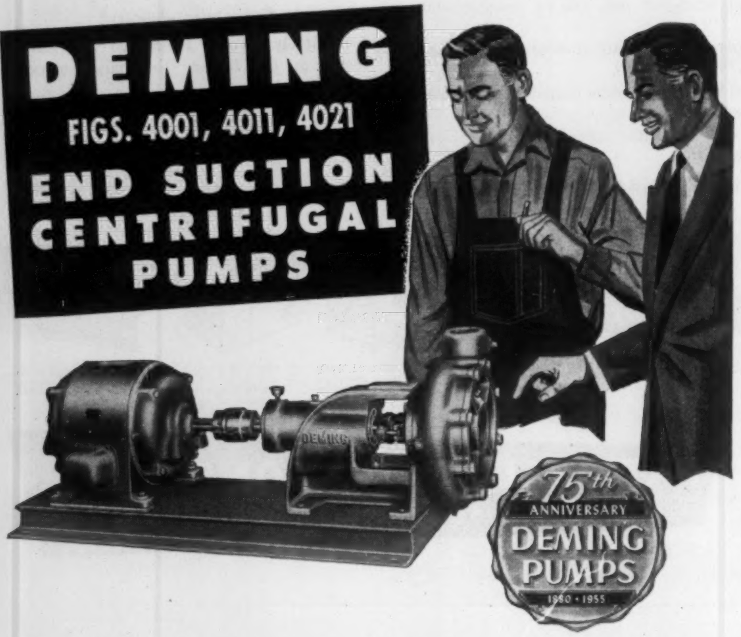
AQUA-SAVER
T. M. REGISTERED U. S. PATENT OFFICE
COOLING TOWERS

Here's the Solution to a wide range of liquid handling jobs!

DEMING
FIGS. 4001, 4011, 4021
END SUCTION CENTRIFUGAL PUMPS



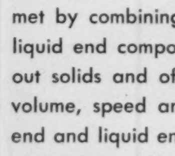
Matching standard pumps to special conditions is simplified by the separate liquid end construction and optional features of this type of Deming End Suction Centrifugal Pump. Specific requirements are met by combining the proper power end components with the proper liquid end components. Corrosive or non-corrosive liquids with or without solids and of different viscosities can be handled at the required volume, speed and head by selecting the best combination of power end and liquid end for the conditions. A simplified *Unit Number System of Selection* (devised by The Deming Company) guarantees non-overloading of the power unit specified. This is one of the features included in illustrated BULLETIN 4011 which fully explains the modern construction and operating advantages of Deming End Suction Centrifugal Pumps Nos. 4001, 4011, and 4021.

Send for Illustrated Bulletin No. 4011

THE DEMING COMPANY
560 Broadway, Salem, Ohio

Please send free copy of Bulletin 4011 and name of nearest Deming Distributor.

Name____________________
Company____________________
City__________ Zone____ State________



WHO'S WHAT

Continued

▶ *AMANA REFRIGERATION, INC.*—Amana of Washington, Inc., distributor for room air conditioners and freezers in the District of Columbia, adjacent Virginia counties and Cumberland, Md. area.

▶ *AIRTEMP CONSTRUCTION CORP., CHRYSLER CORP.*—W. F. Jeffers, head of field operations in the Dallas area; W. J. Bartkow, field representative in Miami; N. J. Plieman, a similar post in the Dayton area.

▶ *CLEAVER-BROOKS CO.*—Rex Bircket & Co., distributor for boiler equipment in Oklahoma and northwestern Arkansas.

▶ *TYPHOON AIR CONDITIONING CO., INC.*—William C. Boismier, district sales manager in Oklahoma, the Texas Panhandle and Wichita Falls area; C. E. Ryman, a similar post in the San Antonio, Houston, Corpus Christi and Rio Grande Valley territory.

▶ *NATIONAL RADIATOR CO.*—D. E. Weidner, heating products sales in Montana, eastern Washington and northern Idaho.

▶ *FEDDERS-QUIGAN CORP.*—Elliot-Lewis Corp., representative in Philadelphia area.

▶ *CORY CORP.*—Mort Nudelman, southern Texas territory manager, with offices in Houston.

▶ *GENERAL CONTROLS CO.*—Richard B. Barger, New York regional manager.

▶ *AMERICAN BLOWER CORP.*—S. A. Meier, manager of new direct factory branch office in Phoenix.

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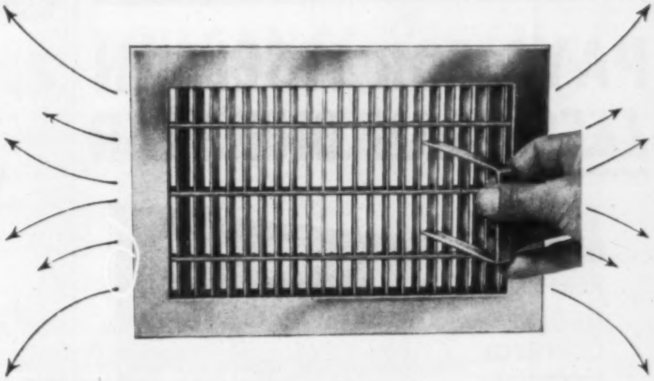
in SCHOOLS
in HOSPITALS
in PUBLIC BUILDINGS



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Solid 14 gauge Bars make the Grilles and Registers rugged and long lasting. Their interlocking construction makes them Tamper-proof — adjustable only with special tool provided with each order. Where you want the best in construction and performance — there is no other choice. It's R & G all the way!

- **Constructed of sturdy 14 gauge steel bars.**
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Complete Line of Registers and Grilles for
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REGISTERS and GRILLES

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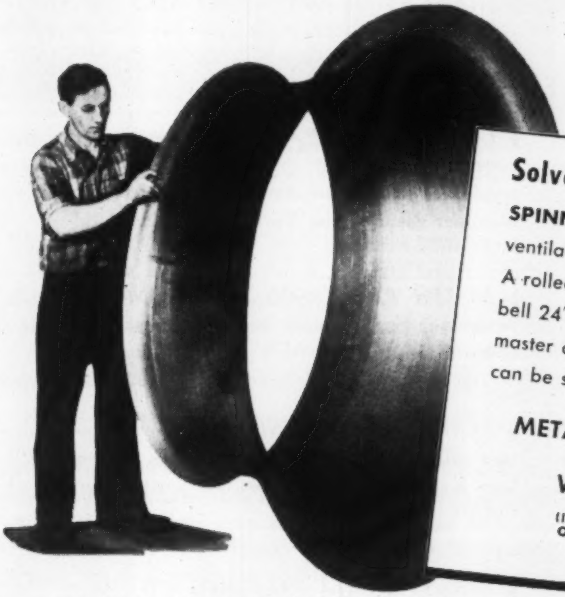

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Solves Production-Forming Problems Like This—

SPINNING "jumbo" sized forms like this inlet bell for a large ventilating blower is no problem the PHOENIXSPUN way! — A rolled and welded sheet of 14-gauge steel becomes an inlet bell 24" deep and 72" in diameter, under the skilled hands of master craftsmen. Large or small, your special forming needs can be served as readily.

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(Inert Gas, Arc, Oxy-Acetylene)

DEEP DRAWING
(To 350 Tons)

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WRITE for Illustrated Bulletins, or send prints and specifications for prompt quotations.

Metal Spinning Div., **PHOENIX PRODUCTS CO.**
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PAYS FOR ITSELF IN *LESS* THAN ONE YEAR

Install PERFEX DRAFT CONTROL SYSTEMS*

*In practically every installation Perfex Draft Control Systems have "paid their way" within the year. Depend on these versatile automatic systems to save you labor; save you time, and save you fuel. Perfex systems are easily installed; not complicated to operate; reduce maintenance and lengthen equipment life; provide minimum air pollution and constant heat flow at even temperature. Your Perfex Engineer is ready to help you select the right controls for your specific requirements. Remember — *you can specify with confidence when you specify PERFEX.*

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WHO'S WHAT

Continued

▶ *WOLVERINE TUBE, DIV. OF CALUMET & HECLA, INC.*—Richard M. Scott, sales representative in Wayne County, Mich., calling on wholesaler accounts only; A. B. Murray Co., sales agent for condenser and heat exchanger tubes in the Elizabeth, N. J. area.

▶ *MODINE MFG. CO.*—William L. Beale, sales representative in the Albuquerque territory.

▶ *HEAT TIMER CORP.*—Enterprise Heat and Power Co., Chicago distributor in Midwest area.

▶ *TECTUM DIV. of the ALLIANCE MFG. CO.*—John Taliaferro, southern district manager covering the North and South Carolina, Georgia, Florida, Alabama, Tennessee, Mississippi and Louisiana area.

▶ *PAINE CO.*—Gulf Sales Agency, distributor in Louisiana, Arkansas, Mississippi and western Tennessee; Seeger-Williams, Inc., New England representative.

▶ *MINNEAPOLIS-HONEYWELL REGULATOR CO.*—Art DePuy, assistant regional manager of central sales region, with headquarters in Cleveland.

▶ *COCHRANE CORP.*—Turbine Equipment Co., representative for water conditioning equipment, steam specialties and condensate booster and return systems in upper eastern New York State.

▶ *JOSEPH T. RYERSON & SON, INC.*—Harry E. Anderson, Seattle plant representative for Ryertex-Glyco division.

▶ *PENN CONTROLS, INC.*—William F. Bowen, district office manager for the St. Louis territory; William Kase, sales engineer for the North Bergen, N. J. district office.

▶ *PENNSYLVANIA SALT MFG. CO.*—M. S. Pancoast, representative for the company's Metal Processing Department in its New York territory. His headquarters will be in Syracuse.

▶ *WM. STEINEN MFG. CO.*—Paul Oehler & Co., distributor in Missouri and southern Illinois.

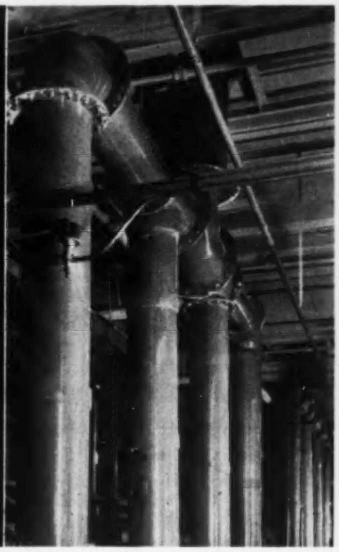
SULPHURIC ACID FUMES HARMLESS

to Duct System made of

Boltaron 6200

unplasticized PVC

"We have done no maintenance since it was installed 16 months ago," says Dexter Lock Company, "We are well satisfied."



Dexter Lock's huge risers of Boltaron 6200 are shown off the anodizing tanks, going up and through the roof where other Boltaron ducts carry fumes into exhaust fan. "We are well satisfied with the Boltaron 6200 duct system and the service we have received from the Boltaron Fabricator, Carpart Corp., Owosso, Mich.," reported the Company spokesman.

GRAND RAPIDS, MICH.—Boltaron 6200 has done it again. The awesome problem of handling sulphuric acid fumes for months — *perhaps years* — without maintenance, replacement or costly shutdowns has been solved at Dexter Lock Company, a subsidiary of National Brass Company. The answer was *and is* Boltaron 6200.

Highly versatile and readily adapted to complicated shapes, Boltaron 6200 has chemical resistance to both strong and weak organic and inorganic acids, alkalies, alcohol and foodstuffs. It is non-metallic and only half the weight of aluminum. Available in sheet, pipe (and fittings), rod and block stock, Boltaron can be drawn, formed, molded, machined and hot air welded.

Whatever your problem, experienced engineers and fabricators coast to coast and in Canada are ready to help you. Write Box 107 for complete information.

H. N. HARTWELL & SON, INC.

Industrial Plastics Division, Park Square Bldg., Boston, Massachusetts

NEED EXTRA IMPACT STRENGTH? Ask about Boltaron 7200.

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Specify

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LIMITS • THERMOSTATS • RELAYS PRIMARIES • VALVES

for

HEATING and COOLING

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Longer life and proven performance distinguish *all* Perfex controls — and there's a finer, economical Perfex control designed to fit your specific oil, gas or coal application. Whatever your heating or cooling requirements Perfex is at your service, giving *you* personal attention. Write for complete catalog and descriptive literature.

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Automatic Controls for Heating, Air Conditioning, Appliances • Industrial Cooling Radiators • Heat Transfer Products • Coils for Refrigeration and Air Conditioning

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Firm ....

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SILENT DUCT

TRADE MARK

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FAST, EASY METHOD
SILENT DUCT

Pre-assembled metal and material pulls out FLAT, ready to fabricate

FOR FLEXIBLE duct connections, Silent Duct is tops from every angle. It costs about half as much as attaching material to metal in your own shop... helps you land business in a competitive market. It's a *standard* product; absolutely uniform in construction; outstandingly strong and dependable. It's made in your choice of 24 or 26-gauge galvanized steel fastened to either fire, water and mildew-resistant UL approved canvas (Govt. Spec. MIL-D-10860), Johns-Manville asbestos, (wire-filled, if desired), or U.S. Rubber Co. Neoprene coated fibre glass.

Elgen Silent Duct is delivered in 100-foot* (approx.) coils in a handy dispenser carton... *pulls out flat as a pancake* and you only have to cut *one* thickness of metal! Order Silent Duct from your jobber and write us for free folder that tells the whole Silent Duct story. Elgen Manufacturing Corporation, Dept. B1, 41-34 39th St., Long Island City 4, N. Y. *50-foot coils with asbestos are available

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12th International Heating and Ventilating Exposition
Commercial Museum · Philadelphia · Jan. 24-28
Booth S-92

ELGEN
SILENT DUCT
UNION MADE • PATENT PENDING
SAVES ASSEMBLING FLEXIBLE CONNECTORS

WHO'S WHAT

Continued

▶ *SUPERIOR VALVE & FITTINGS CO.*—Olan C. Reese Co., representative in Texas, Oklahoma, New Mexico, Arkansas and Louisiana, with headquarters in Houston.

▶ *LEDEEN MFG. CO.*—Unisco, Inc., distributors in southeastern New York, including New York City and Long Island, and northeastern Pennsylvania.

▶ *PATTERSON-KELLEY CO.*—Frank Hockett Co., exclusive representative in Arizona for the hot water storage heater, heat exchanger and refrigeration and air conditioning equipment divisions.

▶ *STANDARD PRESSED STEEL CO.*—Donald C. Buecker, assigned to Minneapolis sales office, covering Minnesota and western Wisconsin.

▶ *INCINERATION DIV., BOWSER, INC.*—Peninsular Distributing Co., distributor for "Incinor" in the Detroit area.

▶ *ORANGEBURG MFG. CO.*—William P. Paulson, district sales manager for Arizona, New Mexico and southern California, with headquarters in Los Angeles.

▶ *TRANE CO.*—Fred Raible, manager of West Hartford, Conn. office.

▶ *WATTS REGULATOR CO.*—John Dale, New England agent, moved from Boston to 118 Cypress St., Brookline, Mass.

▶ *THATCHER FURNACE CO.*—Robert A. Schulz, sales representative out of Chicago office to service Wisconsin and Upper Michigan.

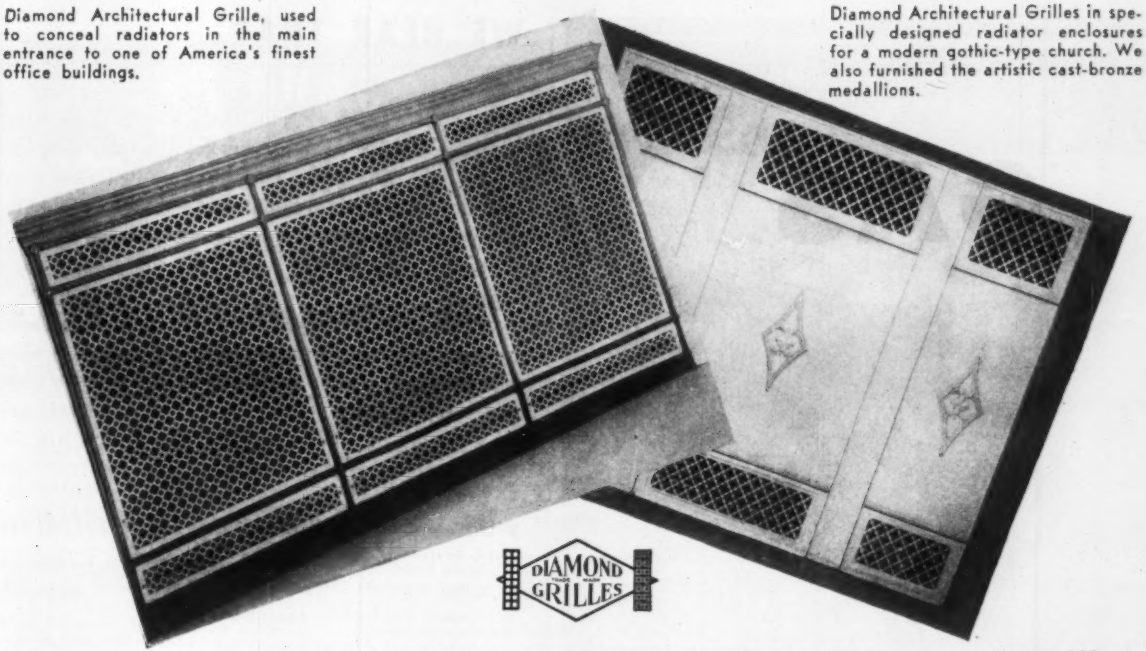
▶ *GENERAL ELECTRIC CO.*—Fisher Oil Co., distributor for "Weathertron" in Delaware County, Indiana area.

▶ *FURNAS ELECTRIC CO.*—W. F. Lisman, general representative for sales to the original equipment market.

▶ *ELLIOTT CO.*—O. M. Sievert, Kansas City district manager.

Diamond Architectural Grille, used to conceal radiators in the main entrance to one of America's finest office buildings.

Diamond Architectural Grilles in specially designed radiator enclosures for a modern gothic-type church. We also furnished the artistic cast-bronze medallions.



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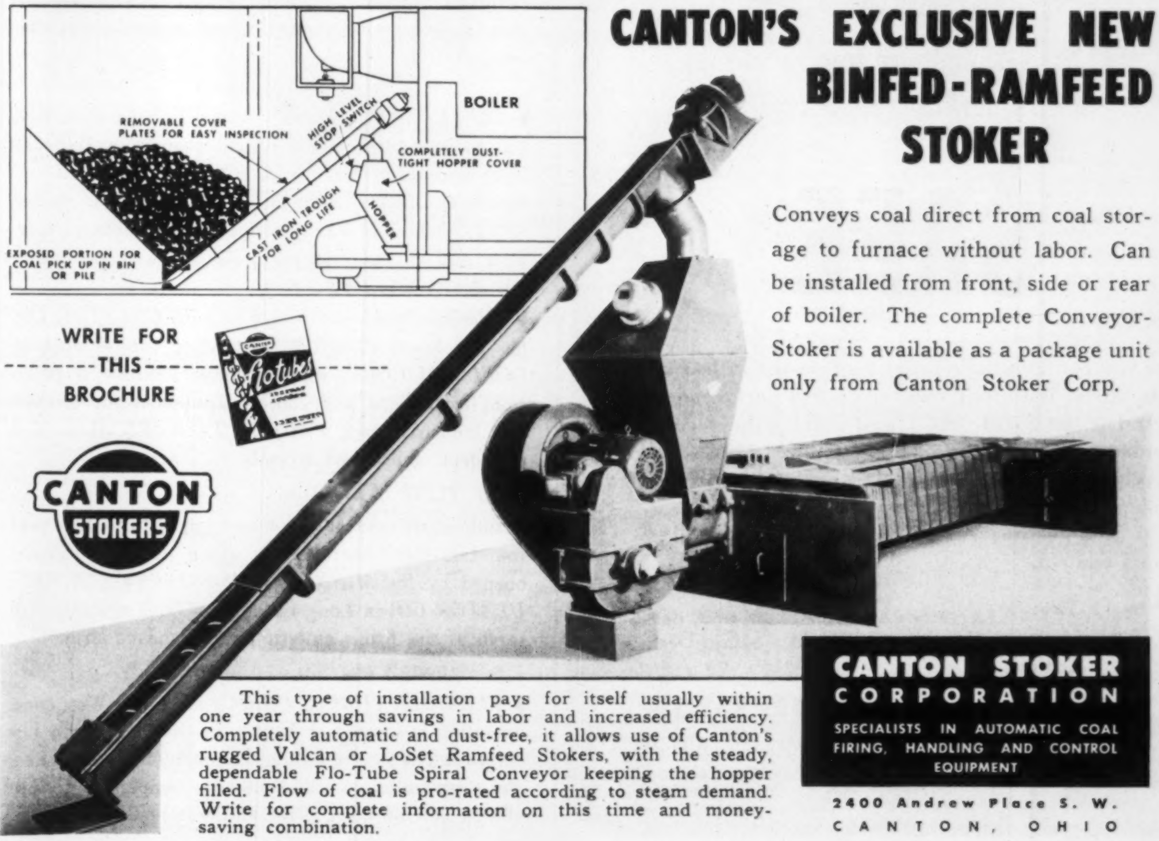
In America's Finest Buildings—Diamond Architectural Grilles

Stamped out of heavy-gauge metals, in a wide variety of artistic designs, Diamond Architectural Grilles meet every grille requirement in the Heating, Ventilating and Air Conditioning Field. Clean-cut, accurately-spaced perforations, superior finish, moderate cost and dependable deliveries—all combine to make them the choice of leading architects and engineers for the better types of buildings.

Bulletin 41, four pages packed full of specific information, illustrates and describes a number of popular designs and applications. Catalog 36, 100 pages, contains actual-size illustrations of ALL Diamond Grille designs, together with complete working data and much additional information regarding other Diamond perforated-metal products. Write for the one you want — no charge or obligation.

DIAMOND MANUFACTURING COMPANY, Box 45, WYOMING (Wilkes-Barre Area), PA

CANTON'S EXCLUSIVE NEW BINFED-RAMFEED STOKER


BOILER
REMOVABLE COVER PLATES FOR EASY INSPECTION
HIGH LEVEL STOP SWITCH
COMPLETELY DUST-TIGHT HOPPER COVER
CAST IRON TROUGH FOR LONG LIFE
HOPPER
EXPOSED PORTION FOR COAL PICK UP IN BIN OR PILE
Flotubes
CANTON

Conveys coal direct from coal storage to furnace without labor. Can be installed from front, side or rear of boiler. The complete Conveyor-Stoker is available as a package unit only from Canton Stoker Corp.

WRITE FOR THIS BROCHURE

CANTON STOKERS

This type of installation pays for itself usually within one year through savings in labor and increased efficiency. Completely automatic and dust-free, it allows use of Canton's rugged Vulcan or LoSet Ramfeed Stokers, with the steady, dependable Flo-Tube Spiral Conveyor keeping the hopper filled. Flow of coal is pro-rated according to steam demand. Write for complete information on this time and money-saving combination.

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SPECIALISTS IN AUTOMATIC COAL FIRING, HANDLING AND CONTROL EQUIPMENT

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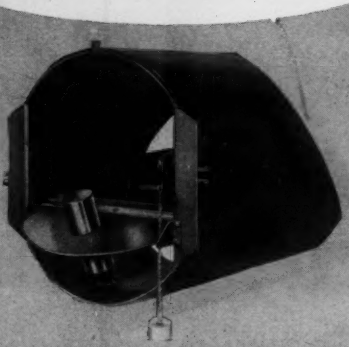
CANTON, OHIO

For commercial & industrial heating with

GAS



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"MG" Draft Controls are recommended by the nation's leading gas companies as

SAFE

Now you can eliminate heavy fuel wastes with complete safety. With four years of perfect performance behind it the Field "MG" now carries the recommendation of leading gas companies across the country—fully safe, absolutely dependable, highly efficient. But be sure the control you install is a Field. In a gas installation only a perfect control is a good control.

Write for technical information and performance data on the Field "MG" Draft Control.

FIELD CONTROL DIVISION
of H. D. Conkey & Company — Mendota, Illinois
AFFILIATES: Conco Building Products, Inc. — Brick, Tile, Stone
Conco Materials Handling Division — Cranes, Hoists

WE HEAR THAT . . .

▶ *ROBERT J. McKAY* and *JOSEPH MELTZER* have announced their establishment of *SEABOARD INSTALLATIONS, INC.* The company will serve as mechanical engineers and contractors for air conditioning, heating, refrigeration, process piping, etc. The company is located at 6 E. 39th St., New York 16.

▶ A new addition has been made to the main factory building of the *BARRY BLOWER CO.*, Minneapolis. The addition will be used exclusively for assembly and shipping. This will mean an automatic enlargement of the present factory facilities which will be used henceforth for fabrication.

▶ Directors of *CARRIER CORP.* and *AFFILIATED GAS EQUIPMENT CO.* have announced an agreement to merge the two companies. Their combined sales last year were $227 million.

▶ *ALLOY STEEL PRODUCTS CO.* is commemorating its 25th anniversary as producer of corrosion-resistant valves.

▶ *KRITZER RADIANT COILS, INC.'s* enlarged laboratory facilities for development and code testing and rating of radiant baseboard and other heating products, includes twin test booths in a controlled temperature, draft free room.

▶ *PERFEX CORP.'s* newly formed Refrigeration Div. will manufacture condenser and evaporator coils for room and residential air conditioning units, self-contained equipment, automotive cooling units, chilled water systems, hot water heating, and portable refrigeration and air conditioning units.

▶ *MINNEAPOLIS-HONEYWELL REGULATOR CO.* has purchased all of the outstanding capital stock of *DOELCAM CORP.*, Boston, manufacturers of precision instruments and control equipment for aircraft and industrial uses, *PAUL B. WISHART*, Honeywell president, announced recently.

▶ Individual control of office temperatures the year round is the feature of an office building recently opened by the *MINNEAPOLIS-HONEYWELL REGULATOR CO.* in Long Island City. The structure will serve as the firm's eastern regional headquarters.

▶ *FLEXIBLE TUBING CORP.'s* expanded West coast operation is located at 12230 W. Olympic Blvd., Los Angeles. The new site, approximately 4500 sq ft in a one story building, will house the company's western offices, sub-assembly plant and warehouse.

They SELL! They PLEASE!

AURORA

CLOSE-COUPLED

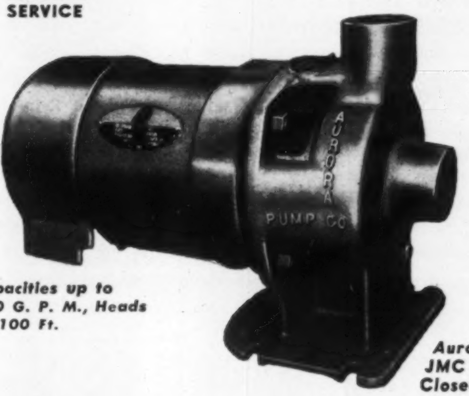
Packaged

AIR CONDITIONING PUMPS

for
EVAPORATOR COOLING TOWERS
●
AIR CONDITIONING UNITS
●
also for
GENERAL SERVICE

These are outstanding pumps, high in favor with air conditioning contractors and manufacturers of air conditioning equipment. Mechanical seal requires no packing or maintenance. Disassembly without disturbing pipe connections or hold down bolts.

- LOW COST
- SMOOTH, QUIET
- DEPENDABLE
- LONG LIVED
- MECHANICAL SEAL
- DISASSEMBLY is QUICK, SIMPLE
- CARRIED IN STOCK



Capacities up to 150 G. P. M., Heads to 100 Ft.

Aurora Type JMC Pump — Close-Coupled

CASINGS vertically split. Casing wearing ring standard.

MECHANICAL SEAL—standard, located in packing cover.

IMPELLER — balanced, enclosed type, high grade bronze.

MOTOR—NEMA specs., stainless steel shaft on JMC — for all circuits and various enclosures.

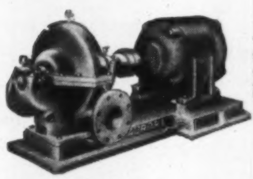
BALL BEARINGS — on JMC, built into motor.

OTHER AURORA AIR CONDITIONING UNITS

We are also in a position to supply various sizes of air conditioning pumps in V-Belt drive, and flexible coupling drive. Our large size type G.M.C. Close-Coupled Pumps can be furnished up to 800 G. P. M. and heads to 200 ft.

ALSO — AURORA SPLIT CASE CENTRIFUGAL PUMPS

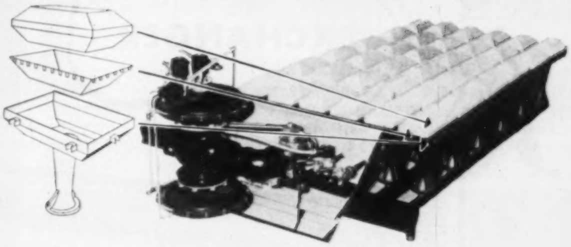
— single and two stage for water supply, handling condenser circulating water, brine circulation, booster service and many other duties.



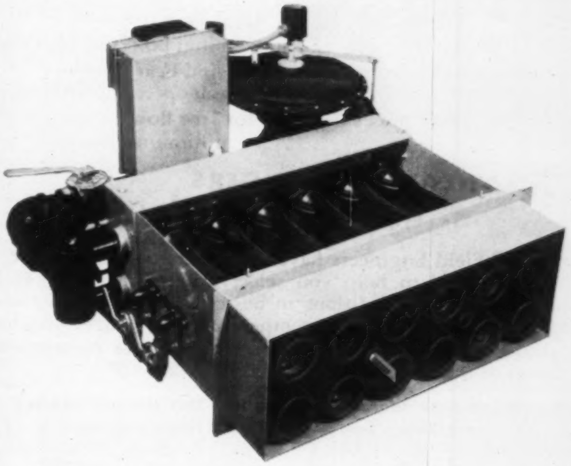
Complete Information on Request

AURORA PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY
80 LOUCKS STREET AURORA • ILLINOIS

for Gas Firing



The UPSHOT TRULIRADIANT GAS BURNER
for vertical firing of steel firebox, cast iron and brickset boilers. An outstanding burner with specially designed refractory protection for burner heads insuring long life and providing maximum heat transfer to boiler surfaces for high efficiency.



The HORIZONTAL or TYPE "H" GAS BURNER
for Scotch Marine or other type boiler where the "Inshot" type of firing is preferred. Multiple flame retention heads assembled in a heavy gauge housing with balanced air louvres and specifically designed pilots provide the maximum in flexibility and dependability. Complete prewiring and factory assembly of controls simplifies, and cuts hours from installation time.

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Taco HEAT
EXCHANGER

You'll see why you get better performance . . .

- Electronically rolled, expanded joints . . . permanently leakproof.
- Tubing held rigidly apart by separators . . . no rubbing, no noise, no wear.
- Baffling engineered for rapid heat transfer . . . maximum operating efficiency.
- Head passes designed for free flow . . . minimum pressure drop.

Taco HEAT EXCHANGERS

. . . engineered to fill *your* requirements

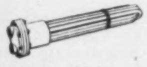
Taco Field Engineers have the experience and technical "know-how" to help you select exactly the right Heat Exchanger for conditions to be met: flow, velocity, temperature rise, log mean temperature difference, pressure drop, transmission rate, and steam pressure or temperatures of other heating media.

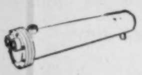
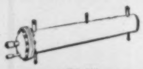
For complete information, write for "Taco Heaters" catalog containing Taco's "pin-point" Selection Charts.

Taco

TACO HEATERS, INCORPORATED
1160 Cranston Street
Cranston 9, R. I.

Circulating Pumps


Tank Heating Units



Chillers

Condensate Coolers
Converters
Fuel Oil Heaters
Oil Coolers
Radiation Heaters
Water Heaters

WE HEAR THAT

Continued

▶ *SPORLAN VALVE CO.* recently conducted a five day company conference and national sales meeting consisting of a two day series of conferences, combined with trips through Sporlan's factories, and a three day sales meeting of field sales representatives and members of the organization.

▶ *The WOLVERINE TUBE* Diamond Key Award, given by the company for outstanding technical papers in the refrigeration field, was awarded in 1954 to *FERRUCCIO RASORI, KOLOSTAT HEATING SYSTEM LTD.*, Montreal.

▶ An educational exhibit, illustrating the basic operating principles of machinery related to business, industrial, community and home life, has been opened to the public by *WORTHINGTON CORP.*, at 99 Park Ave., New York.

▶ *TRIANGLE CONDUIT & CABLE CO., INC.* has announced two new warehouse facilities to speed up service to its customers in the Cleveland and Dallas areas. These warehouses will stock all types of Triangle copper tube and plastic pipe.

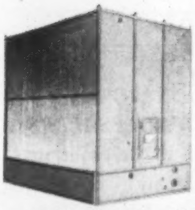
▶ *ACEC ELECTRIC CORP.*, formerly Belgian Electric Sales Corp., has extended its sales and service organization to include large motors up to 70,000 hp as well as single phase motors. The main office is located at 40 E. 49th St., New York 17.

▶ *INDUSTRIAL MANAGEMENT SOCIETY* has announced that the *CENTURY ELECTRIC CO.* has won the second place plaque for its entry in competition for the Ralph H. Landes Methods Improvement contest. The contest is held annually and is aimed to stimulate methods improvements in industrial production.

▶ Construction is under way on a one story office building adjacent to the *UNION ASBESTOS & RUBBER CO.'s* Bloomington, Illinois plant. The new structure will house several Union Asbestos operations presently located in the company's Chicago office.

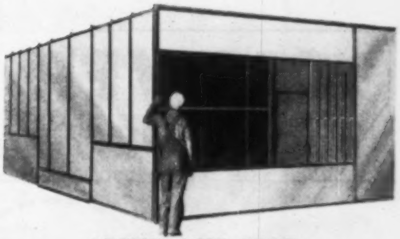
▶ *DONALDSON POWER VENTILATOR CO.* has enlarged its facilities at 11847 Vose St., North Hollywood, Calif.

▶ *REYNOLDS CORP.*, Chicago ventilating contractor and metal fabricator, has moved to 6549 W. George St. in that city.

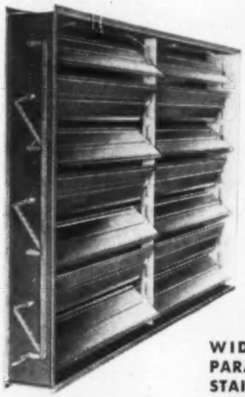


SPRAY AIR WASHER
SINGLE AND TWO BANK DESIGNS AVAILABLE IN A WIDE RANGE OF SIZES. FACTORY INSULATED CONSTRUCTION ILLUSTRATED

CAPILLARY AIR WASHER
CLASS I (CONCURRENT) SHOWN. CONSTRUCTED FOR 1000 TO 160,000 CFM THESE WASHERS OFFER PATENTED FEATURES FOR HIGHEST EFFICIENCY



ARTICULATED UNIT
THESE COMPLETE FACTORY INSULATED UNITS COMBINE PANELS, DAMPERS, WASHER OR SURFACE DEHUMIDIFIER AND OTHER FEATURES IN A SINGLE CO-ORDINATED ASSEMBLY.



AIR CONDITIONING EQUIPMENT

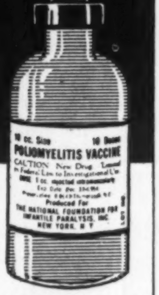
OTHER A & R PRODUCTS
FACTORY INSULATED PANELS
METAL CELL WASHERS
SPECIAL PURPOSE DRYERS

LOUVRE DAMPERS
WIDE FRAME CONSTRUCTION SHOWN. PARALLEL OR PROPORTIONING ACTION WITH STAINLESS STEEL SHAFTS AND BRONZE BEARINGS

A&R

AIR & REFRIGERATION CORPORATION
439 MADISON AVE. · NEW YORK 22, N. Y. · ATLANTA, GA.
SALES REPRESENTATIVES IN PRINCIPAL CITIES

Polio Vaccine Facts



- Developed by Dr. Jonas Salk under March of Dimes grant.
- Inoculation of 425,000 children in 44 states financed by March of Dimes.
- Results of vaccine evaluation by University of Michigan expected before 1955 polio epidemic season.
- Effectiveness of Salk vaccine being determined at a cost of $7,500,000 in March of Dimes funds.

Join the
MARCH OF DIMES
January 3-31

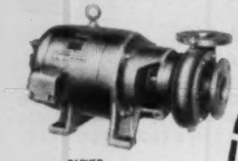
Handy Pump says:

"Pump liquid materials safely, efficiently, economically with BLACKMER HAND PUMPS"

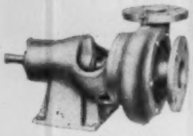
Now you can get Blackmer quality in *both* rotary and piston type hand pumps

BLACKMER PUMPS *liquid materials handling* ®
BLACKMER
Industrial, Hand and Truck Pumps, Strainers, Pressure Control Valves
BLACKMER PUMP COMPANY, GRAND RAPIDS 9, MICH.
DIVISION SALES OFFICES — NEW YORK • ATLANTA • CHICAGO
GRAND RAPIDS • DALLAS • WASHINGTON • SAN FRANCISCO
See Yellow pages for your local sales representative

CARVER has the PUMPS... **TO FIT YOUR NEEDS!**



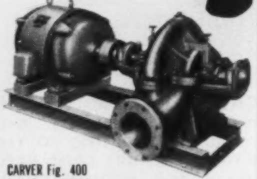
CARVER
L & H PUMPS
30 to 900 G.P.M.



CARVER
Type FL PUMPS
20 to 900 G.P.M.

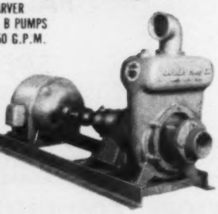
Whatever your requirements, there is a pump in CARVER'S Complete Line that will give you outstanding performance over a wide range of capacities and heads. CARVER . . . your best buy for better pumping.

CARVER PUMP CO.
1460 Hershey Ave.
Muscatine, Iowa



CARVER Fig. 400
Split-Case PUMPS
200 to 2000 G.P.M.

CARVER
MODEL B PUMPS
6 to 150 G.P.M.

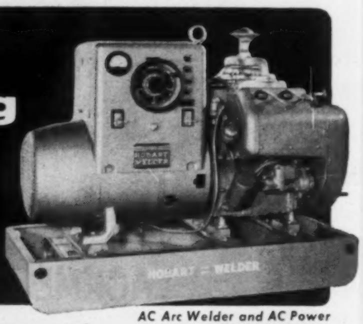


CARVER Model KF PUMPS
Self-Priming
20 to 4000 G.P.M.

Ask for bulletins

CARVER
the quality name in pumps

200 amp. A. C. Welding plus POWER for tools, lights, etc.

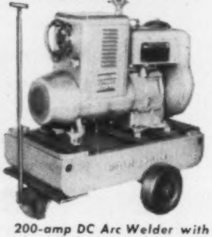


AC Arc Welder and AC Power Unit for welding and operating lights, tools, etc.

To speed up the job and cut costs, plumbers and metalsmiths are using low cost Hobart Arc Welding wherever they can.

A popular model with the plumbing and heating contractors is the combination AC Arc Welder and AC Power Unit. This two purpose machine supplies 200 amperes for welding or 5 KW AC Power for operating tools and lights where electric power is not available.

No matter what your requirements are, Hobart has a welder that is right for your work. Compact, lightweight welders for easy loading in truck or trailer or AC Transformer type welders for shop work. Check and return the coupon today for complete details.



200-amp DC Arc Welder with air-cooled engine.

AC Transformer Type Welder for general shop use.

HOBART TROY OHIO **WELDERS**

Tear off and MAIL TODAY!

● **HOBART BROTHERS CO.,** Box 515, **Troy, Ohio, U. S. A. Telephone 21223**

Without obligation, please send information on items checked.

☐ AC Welder-AC Power Unit ☐ 200-amp DC Gas Drive
☐ AC Transformer Welder ☐ Electrode samples for______

NAME__________ POSITION__________
FIRM__________
ADDRESS__________

WE HEAR THAT

Continued

▶ *AIR CONDITIONING AND REFRIGERATION WHOLESALERS* is the new name of the association of refrigeration and air conditioning equipment and supplies wholesalers which has been known as *REFRIGERATION EQUIPMENT WHOLESALERS ASSOCIATION*. Formal action on the name change was taken at the annual meeting held recently in St. Louis.

▶ *CONOFLOW CORP.* recently held a sales-engineering conference for its representatives at the company's executive offices in Philadelphia.

▶ Innovations by the *O. A. SUTTON CORP.*, in straight-line production, machine design, quality control and selection of personnel have resulted in more efficient production of the company's fractional horsepower motors, the manufacturer reports.

▶ Fifty-nine newly appointed sales engineers and technicians recently completed the five week training program of the *JOHNSON SERVICE CO.*, Milwaukee, manufacturers, engineers and contractors of automatic temperature and air conditioning control systems.

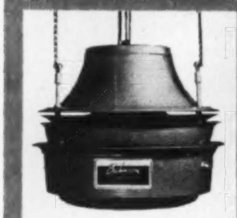
▶ *AMERICAN FOUNDRYMEN'S SOCIETY* recently moved its national headquarters to Des Plains, Illinois. Dedication ceremonies of the new building project were attended by over 300 AFS members and guests.

▶ A 12 page report by the *A. O. SMITH CORP.*, sent to 370 American Gas Assn. members plus officers of leading gas utilities, said that A. O. Smith's latest research endeavor is in the direction of a new type of gas fired air conditioning.

Highest Capacity at Lowest Cost . . .

BAHNSON HUMIDIFIERS

A TYPE FOR EVERY INDUSTRIAL NEED



TYPE E: Quickly installed; evaporates up to 3 gph with ¼ hp motor; ideal for small areas.

TYPE BA: Extremely versatile, for large areas. Water or steam units with capacity to 30 gph.

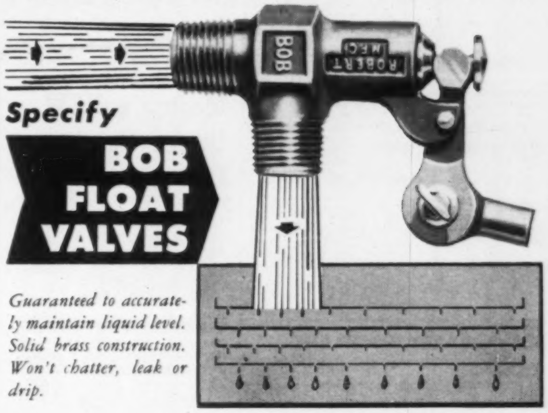
- Fully automatic
- Trouble-free
- No floor space
- Any capacity
- Free, complete engineering service

Write for specific recommendations, or get details on complete line in Catalog H-3

Bahnson
COMPANY
WINSTON-SALEM, N. C.

AIR CONDITIONING • HUMIDIFICATION

The Standard Valve For COOLING TOWER applications . . .



Specify **BOB FLOAT VALVES**

Guaranteed to accurately maintain liquid level. Solid brass construction. Won't chatter, leak or drip.

Standard equipment for Major COOLING TOWER manufacturers and piping fabricators for POSITIVE-ACTION and unsurpassed performance under the toughest service conditions. Take advantage of the savings thru standardization *—one source for completeness of line—smaller and more flexible inventory—preventive maintenance—safety—durability—interchangeability—increase of sales—customer satisfaction and* ECONOMY.

Competitively priced and available in sizes from ⅜" to 1½". Write for details of complete line.

ROBERT Manufacturing Company
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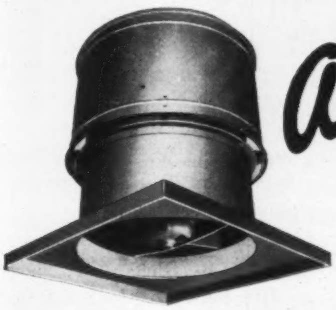
For removing a LARGE VOLUME of Fumes or Air at HIGH VELOCITY



Allen

VERTICAL DISCHARGE FAN

Whenever you face the problem of discharging fumes or vapors through a roof ventilator so that they will not short circuit back through building openings, you'll find the solution in this new Vertical Discharge Fan. It is designed especially for industrial applications that require the removal of a large volume at high velocity. The "VD" roof fan is fabricated of zinc-coated iron sheet with welded construction throughout. Automatic wing dampers open with air blast, close weathertight when not operating. The "VD" is available as direct drive with motor mounted inside air stream or as "VDR" with motor mounted outside throat of ventilator. Either type is available in a wide range of capacities and sizes.

Write for catalog on complete line of roof ventilators.

ALLEN ENGINEERED VENTILATION

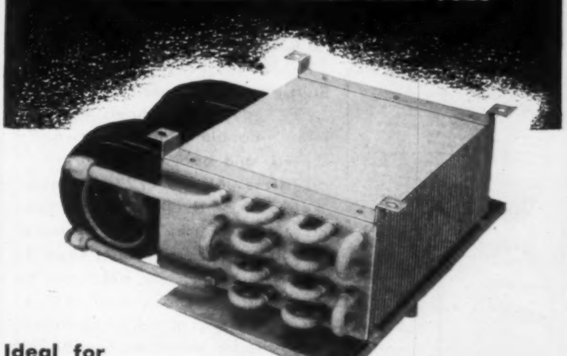
ALLEN COOLER & VENTILATOR INC.
ROCHESTER, MICH.

Roof Ventilators for Every Commercial and Industrial Need

Compact, Efficient Design

REMPE DOUBLE INLET BLOWER EVAPORATOR

FOR FRACTIONAL HORSEPOWER JOBS



Ideal for all types of Coolers— Displays Cases — Show Cases — Pharmaceutical Refrigerators.

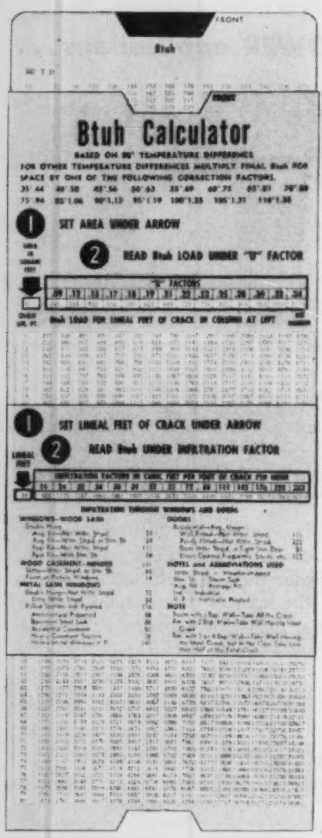
For use on all cooler jobs for holding temperatures from 34° to 50°. Lowest suction gas 24°.
Available for Freon or Ammonia service. Small size—rugged construction. Prompt shipment. Write for bulletin.

HEAT TRANSFER EQUIPMENT REMPE CO. Founded 1890

REMPE COMPANY

342 N. Sacramento Blvd., Chicago 12, Ill.

Complete facilities for fabrication of pipe coils—all types—all materials. Engineering service. Send details for price.



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Morton's NEW Direct Reading Calculators

Operate like slide rules, yet read DIRECT like tables. No interpolating. Of lifetime vinyl plastic, 3-¾" x 9" size.

Btuh (Crackage Method) Calculator gives correct heat loss for any area under a choice of 28 factors, and crackage Btuh under 15 infiltration factors. $3.85 postpaid.

Area and Crackage Calculator. $4.75 postpaid.

BTU (Air Change Method) Calculator. $3.75 postpaid.

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Order today on 10-day Money-Back Guarantee, or request free circular. Price includes carrying case.

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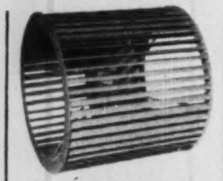
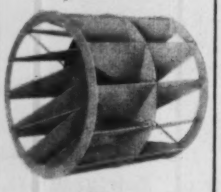
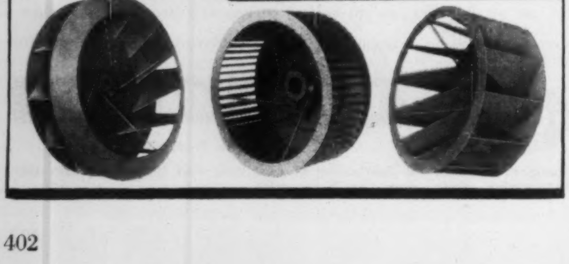
BARRY *Industrial* BLOWER WHEELS

Built to your specifications. All types heavy duty wheels — single inlet, double inlet, forwardly curved, and backwardly curved — all sizes 6" to 72" diameter. Welded or riveted construction. Prompt deliveries. BARRY blower wheels are precision built, expertly trued, and perfectly balanced by specialists for long, smooth service. Send specifications for quotation, performance data, etc. to BARRY BLOWER CO., Minneapolis 18, Minnesota.







NEW BOOKS & REPORTS...

Pipe-Type Cable Corrosion Protection Practices in the Utilities Industry—15 pp. National Association of Corrosion Engineers, 1061 M & M Bldg., Houston 2. 50c.

Simplified Practice Recommendation R254-54, Packaging of Steel Pipe Couplings—Superintendent of Documents, U.S. Government Printing Office, Washington 25. 5c. 25 percent discount given on orders of 100 or more copies.

National Fire Codes—Vol. I, Flammable Liquids and Gases, 672 pp.; Vol. II, Combustible Solids, Dusts, Chemicals and Explosives, 512 pp.; Vol. III, Building Construction and Equipment, 640 pp. National Fire Protection Association, 60 Batterymarch St., Boston 10. Each volume is $6.00.

Air Disinfection With Ultra-Violet Irradiation, Its Effect on Illness Among School-Children—92 pp. Published by Her Majesty's Stationery Office, London. Available from British Information Services, 30 Rockefeller Plaza, New York 20. $1.60.

Industrial Dust—2nd Ed. By Philip Drinker and Theodore Hatch. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $10.00.

Refrigerating Nomograms—By Bendix Christensen. Bilingual. Published by Ingenior-Sammenslutningen, Copenhagen, Denmark.

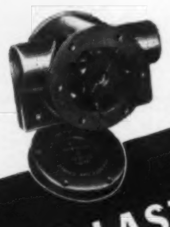
Tentative Specifications for Nickel and Nickel-base Alloy Covered Welding Electrodes—12 pp. American Welding Society, 33 W. 39th St., New York 18, or American Society for Testing Materials, 1916 Race St., Philadelphia 3. 25c.

Radiant Heating—2nd Ed. By Richard W. Shoemaker. 346 pp. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $7.00.

National Electric Code Handbook—8th Ed. 642 pp. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $7.50.

Magnetic Control of Industrial Motors—2nd Ed. By Gerhart W. Heumann. 714 pp. John Wiley & Sons, Inc., 440 4th Ave., New York 16. $9.50.

Modern Physics for the Engineer—Edited by Louis N. Ridenour, vice president, International Telemeter Corp. and visiting professor, University of



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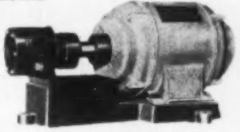
OUT-LASTS OUT-PUMPS *anything in its price class*

This little Jabsco, neoprene-impeller, self priming pump made of Ace hard rubber for handling acids and alkalis, delivers more liquid within its pressure range than any other pump in its weight, size and price class. From 15 gpm at 22 ft. head to 5 gpm at 72 ft. head. Self lubricated flexible impeller outlasts conventional metal rotors. Easy to service.



Ace hard rubber centrifugal and gear pumps also available. Write today for free Bulletin 97-A.

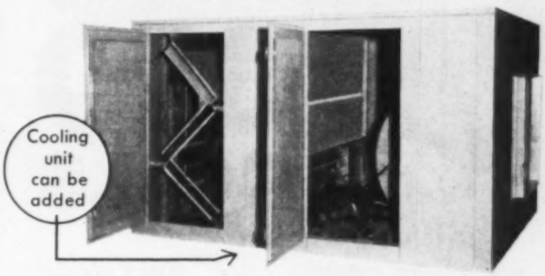
ACE rubber and plastic
® processing equipment · SINCE 1852

AMERICAN HARD RUBBER COMPANY, 93 Worth St., New York 13, N. Y.

The new
KLIMATIC KING

a compact heating, ventilating unit

Ideal for applications where high humidity is a problem



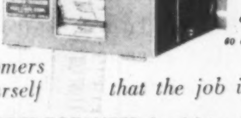
Designed for dairy, food processing and industrial plants. The Klimatic King is fabricated with a corrosion-resistant galvanized steel casing, insulated to eliminate condensation and dripping. Automatic controls for temperature and ventilation. Two speed motor for "high" and "low" production periods, provides maximum economy of operation. These and many other features are standard with the Klimatic King, not "optional extras". The quality leader in its field. Sizes 3,500 to 20,000 CFM.

Architect and dealer inquiries invited. More than fifty years experience is at your disposal. Write today

THE King CO. OF OWATONNA
NORTH WINONA ST. OWATONNA, MINNESOTA
MANUFACTURERS OF SHARP FREEZE, COOLING, VENTILATING AND HEATING SYSTEMS

makes a record of job performance!

HEAT RECORDER-TOTALIZER



operates on either 115 or 230 volts 60 cycle AC current

Convince your customers satisfy yourself that the job is right!

The HEAT RECORDER-TOTALIZER furnishes all the data you could get watching the heating plant 24 hrs.-a-day with stopwatch, pad, pencil and adding machine.

In addition to marking on a chronological tape the time the heat went on, how long it was on, when it went off, etc., the HEAT RECORDER-TOTALIZER adds up on the totalizer meter the total "ON" time.

No chart to change daily! One tape roll lasts almost a heating season. The HEAT RECORDER-TOTALIZER operates electrically — in any plant, large or small. Use it from job to job — or better yet, make it part of the installation . . . it's priced so low!

Assures intelligent and efficient plant operation. Saves its cost many times in fuel, repairs, maintenance!

$55. TRADE PRICE

write for detailed literature A
HEAT-TIMER *corporation*
657 Broadway, New York 12, N. Y. AL 4-5380

Mfrs. of HEAT-TIMER electronic controls, Heat Recorder+Totalizer, Thermovalve, Varivalve, Motorized Valves, Smoke-Eye Smoke Alarm, Fire-Chief Fire Alarm

NEW BACKWARD CURVE

AirMpeler

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Sizes 10" to 72"—600 to 47,000 C.F.M.

QUALITY plus BEAUTY

Proven Performance

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C. L. Ammerman Company
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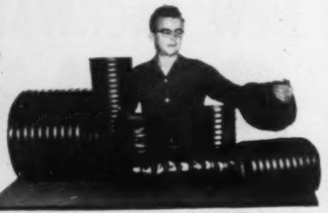
G&O COILS for HEATING and COOLING

G&O RADIATION

A full line of sizes now available to meet all industrial requirements. Send for catalog.

THE G&O MANUFACTURING COMPANY
New Haven 8, Connecticut
Pioneer Manufacturers of Square Finned Tubing in the United States



Solve your Problems in

Sizes 1¼" to 36" I.D.

- AIR CONDITIONING
- FUME CONTROL AND VENTILATION
- DUST AND CHIP COLLECTION
- MATERIALS HANDLING

with **FLEXAUST®** HOSE

The high-quality, reinforced, spiral-wire hose designed for moving air, dust, fumes, materials.

Here Are Cost-Cutting Advantages:

- **EASY INSTALLATION** — Unskilled labor can cut, couple or cuff Flexaust hose in a jiffy. It's so light, a child can lift it.
- **DURABLE, STRONG** — Flexaust hose is highly resistant to abrasives, aging, corrosion, moisture, chemical deterioration and flexing fatigue. It has a bonded, double ply, double overlap construction.
- **AIRTIGHT**—Ideal for pressure, suction, or gravity operations.
- **HIGHLY FLEXIBLE** — Can maintain large sections on sharp bends; won't kink or flatten.

WRITE TODAY for new bulletins on FLEXAUST hose and companion PORTOVENT® duct: Product Information • Accessories and Installation • Technical Data • Application Data.

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FLEXAUST® PORTOVENT® BLOFLEX* *Trade-mark

NEW BOOKS & REPORTS

Continued

California, Los Angeles. 500 pp., ill. McGraw-Hill Book Co., Inc., 330 W. 42nd St., New York 36. $7.50.

PERMIAN BASIN FIFTH BIENNIAL CORROSION TOUR—National Association of Corrosion Engineers. 61 pp. John A. Knox, The Western Co., Midland, Texas. $2.00.

DETERIORATION OF MATERIALS—CAUSES AND PREVENTATIVE TECHNIQUES—Edited by Glenn A. Greathouse and Carl J. Wessel, Prevention of Deterioration Center, National Academy of Sciences—National Research Council in conjunction with Services Technical Committee of the Department of Defense. Reinhold Publishing Co., 330 W. 42nd St., New York 36. $12.00.

DUST SUPPRESSION IN FOUNDRIES—An article by W. B. Lawrie, Engineering Inspector of Factories, contained in October, 1954 issue of Journal of the Institution of Heating and Ventilating Engineers, 49 Cadogan Sq., London, Eng.

ASTM STANDARDS ON COAL AND COKE—164 pp. ASTM Headquarters, 1916 Race St., Philadelphia 3. $2.25 ($1.70 to members).

ADDENDA TO "STANDARDS OF TUBULAR EXCHANGER MANUFACTURERS ASSOCIATION"—3rd Ed., 1952.—12 pp. Copies are free to present holders of this edition of the TEMA STANDARDS from the Association, 53 Park Place, New York 7. The STANDARDS are $5.50 from TEMA.

STUDIES OF THERMAL CONDUCTIVITY OF LIQUIDS, PART III. A THERMOCONDUCTIMETRIC APPARATUS FOR LIQUIDS—Bulletin No. 45, Engineering Experiment Station, Louisiana State University, Baton Rouge. $1.00 (no stamps).

TITANIUM BIBLIOGRAPHY—26 pp. Code No. CTR-306. Office of Technical Services, U.S. Department of Commerce, Room 6227, Washington 25. 50c.

THERMAL CONDUCTIVITY OF METALS AND ALLOYS AT LOW TEMPERATURE—By Robert L. Powell and William A. Blanpied, National Bureau of Standards, Circular 556. 68 pp. U.S. Government Printing Office, Washington 25. 50c.

PRINCIPLES OF ENGINEERING THERMODYNAMICS—2nd Ed. By Paul J. Kiefer, Gilbert Ford Kinney and Milton C. Stewart. 539 pp. John Wiley & Sons, Inc., 440 4th Ave., New York 16. $7.75.

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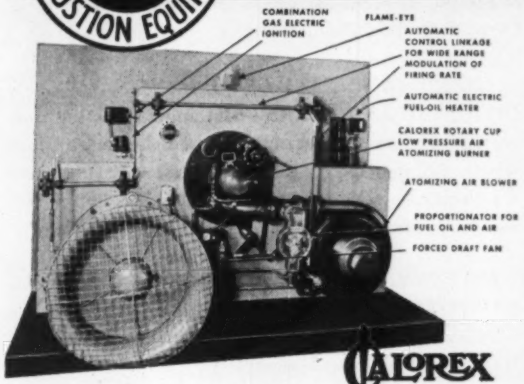
INDUSTRIAL BURNERS


COMBINATION GAS ELECTRIC IGNITION
FLAME-EYE
AUTOMATIC CONTROL LINKAGE FOR WIDE RANGE MODULATION OF FIRING RATE
AUTOMATIC ELECTRIC FUEL-OIL HEATER
CALOREX ROTARY CUP LOW PRESSURE AIR ATOMIZING BURNER
ATOMIZING AIR BLOWER
PROPORTIONATOR FOR FUEL OIL AND AIR
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CALOREX

ROTO-CUP BURNER SYSTEM

W. N. BEST presents a packaged system for automatic firing of fuel oil or combination oil and gas for boilers producing 200 H.P. or over.

W. N. BEST COMBUSTION EQUIPMENT CO., INC.
415 11th Street CARLSTADT, NEW JERSEY

YOU make the Heating and Air Conditioning Equipment

CORNISH makes the

WIRED ASSEMBLIES

to speed up your production

Through integrated engineering and production control from rod mill to molding, we produce complete QUALITY units at lower cost ———

"MADE BY ENGINEERS FOR ENGINEERS"

CORNISH-RUTLAND COMPANY
Rutland, Vermont

Manufacturers' Agents...

Are you interested in securing additional lines?

We are occasionally asked by our manufacturer advertisers to suggest the names of manufacturers' agents in various sections of the country whom they can contact in regard to representation of their industrial and large building heating, piping, and air conditioning products.

If you would like your name listed on our records for inquiries we may receive on your territory, we invite you to write us. There is no charge in connection with this service.

HEATING, PIPING & AIR CONDITIONING
6 North Michigan Avenue, Chicago 2, Illinois

WRITE for this TECHNICAL DATA BOOK
UNIVERSAL
Flexible
METAL HOSE PRODUCTS
TECHNICAL DATA BOOK U-111
UNIVERSAL METAL HOSE COMPANY

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2117 South Kedzie Ave. • Chicago 23, Illinois

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Serving the Electrical Industry

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MINERALLAC

HANGERS, CLIPS, STRAPS AND BUSHINGS

Expert design, choice materials and controlled manufacture have built "top-service and longest life" into Minerallac Electrical Specialties. That's why the electrical industry "prefers Minerallac" ... In steel and Everdur for hanging pipe, conduit, BX cable, etc.

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25 NORTH PEORIA STREET—CHICAGO 7, ILLINOIS

MINERALLAC

MEETINGS & CONVENTIONS

NATIONAL ASSOCIATION OF CORROSION ENGINEERS—Pipe line corrosion short course. January 20-21, University of Houston. Registration fee is $10.00, directed to: Lloyd Nelson, Shell Pipe Line Corp., P.O. Box 2648, Houston.

AMERICAN SOCIETY OF HEATING & AIR-CONDITIONING ENGINEERS—61st annual meeting. January 24-27, Benjamin Franklin and Bellevue-Stratford Hotels, Philadelphia. Headquarters: ASHAE, 62 Worth St., New York 13. See the Show Section in this issue for complete details.

INTERNATIONAL HEATING & VENTILATING EXPOSITION—The Air Conditioning Exposition. January 24-28, Commercial Museum and Convention Hall, Philadelphia. Management: International Exposition Co., 480 Lexington Ave., New York 17. See the Show Section in this issue for complete details.

PLANT MAINTENANCE & ENGINEERING CONFERENCE—January 24-26, International Amphitheater, Chicago. Registration: Clapp & Poliak, Inc., 341 Madison Ave., New York 17.

INSTRUMENTATION FOR THE PROCESS INDUSTRIES—January 26-28, School of Engineering, Chemical Engineering Dept., Texas A&M, College Station, Texas. Registration fee is $10.00 at the Memorial Student Center on the campus. There is no pre-registration.

INDUSTRIAL VENTILATION CONFERENCE—January 31-February 2, Rensselaer Polytechnic Institute, Troy, N.Y. Fee, including text book and February 1 dinner, is $25.00. For applications contact Prof. A.A.K. Booth, Associate Chairman, Cooperative and Extension Education, R.P.I., Troy, N.Y.

McINTYRE-SARANAC CONFERENCE—February 7-9, Town Hall, Saranac Lake, N.Y. Write c/o the conference, P.O. Box 551, Saranac Lake.

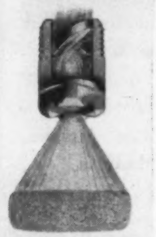
SOCIETY OF THE PLASTICS INDUSTRY, INC.—10th annual *Reinforced Plastics Division Conference*. February 8-10, Hotel Statler, Los Angeles. General chairman: Samuel E. Oleesky, Micronics, Inc., Gardena, Calif.

INDUSTRIAL VENTILATION CONFERENCE—February 14-17, Kellogg Center, Michigan State College, East Lansing, Mich.

NATIONAL WARM AIR HEATING AND AIR CONDITIONING ASSN.—Short courses on the latest trends in the warm air heating industry. February

SPRAYING SYSTEMS CO.

SPRAY NOZZLES



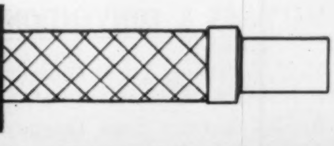
exact performance for every need

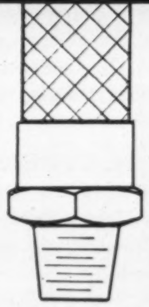
Choice of thousands of standard spray nozzles gives you exact spray pattern, capacity, impact and atomization. PROMPT . . . often immediate delivery from stock.

BE SURE TO WRITE FOR . . . . the most complete spray nozzle catalog ever printed . . . forty-eight pages of detailed information. Write for your free copy of Catalog No. 24.

SPRAYING SYSTEMS CO.
3219 Randolph Street • Bellwood, Illinois

VIBRATION PROBLEM?



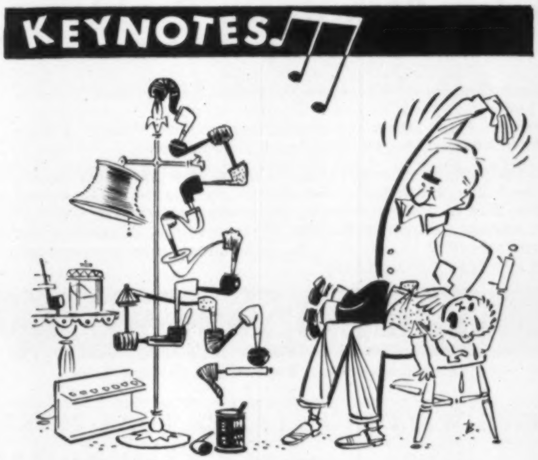


ENGINEERS and SERVICEMEN Are you confronted with vibration and noise problems in compressor lines? If so, specify PACKLESS Flexible Vibration Absorbers for the answer. Size range to fit ¼" O.D. — 10⅛" O.D. copper tubing. Write for Bulletin VA-3.

PACKLESS
METAL HOSE INC.

31-12 WINTHROP AVE., NEW ROCHELLE, N. Y.

KEYNOTES



"But I heard you say yourself that Key Graphite Paste was the best thing on the market for pipe assembly."

That's right, Junior — the ideal joint sealer for lines carrying oil, gasoline, high pressure steam.

Write for FREE sample.

KEY
GRAPHITE PASTE

SEALS TIGHT... BREAKS RIGHT!

A Product of KEY COMPANY

2617 McCasland • East St. Louis, Illinois

DON'T LEAVE YOUR CUSTOMERS COLD---

INSTALL CORTON VALVES

GORTON
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GORTON
AIR ELIMINATOR
Nº 1

the Sure Cure - - - -
for COLD RADIATORS

SEND TODAY FOR

Literature and free handy ruler giving actual sizes of air outlet of fast venting Gorton Valves for every steam heating system.

Ask Your Wholesaler or Write

GORTON VALVES
ESTABLISHED 1887

ASK YOUR WHOLESALER FOR

Gorton Heating Corp., Cranford, N. J.

MEETINGS & CONVENTIONS *(Continued)*

14-17, Oklahoma A & M College; March 9-12, Purdue University; March 28-31, Michigan State College; April 6-8, Penn State College; April 18-21, Iowa State College. Chairman: Bruce McLouth, NWAHACA, 145 Public Sq., Cleveland 14.

NATIONAL ASSOCIATION OF CORROSION ENGINEERS, Tulsa Section—6th Annual Corrosion Short Course for Pipeliners. February 16-18, Mayo Hotel, Tulsa, Okla. Thomas M. Ragland, Phillips Petroleum Co., is chairman of the course.

NATIONAL ASSOCIATION OF CORROSION ENGINEERS—Corrosion short course. March 1-4, Carolyn P. Brown Memorial Center, University of Tennessee, Knoxville. Registration: A. B. Campbell, c/o the association, 1061 M & M Bldg., Houston 2.

11*TH ANNUAL CONFERENCE AND EXHIBITION OF THE NATIONAL ASSOCIATION OF CORROSION ENGINEERS*—March 7-11, Palmer House, Chicago. Registration: A. B. Campbell, c/o the association, 1061 M & M Bldg., Houston 2.

OIL-HEAT INSTITUTE OF AMERICA—33rd annual convention. Tentatively April 4-7, Edgewater Beach Hotel, Chicago. OHI headquarters, 500 Fifth Ave., New York 36.

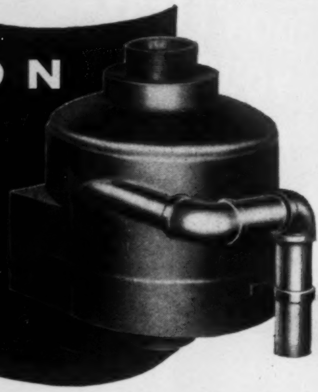
NATIONAL DISTRICT HEATING ASSOCIATION—46th annual meeting. May 23-26, Edgewater Beach Hotel, Chicago. The association is at 827 Euclid Ave., Pittsburgh 6.

AMERICAN SOCIETY FOR TESTING MATERIALS—June 26-July 1, Chalfonte-Haddon Hall, Atlantic City, N.J. 1955 spring meeting—January 31-February 4, Netherland Plaza Hotel, Cincinnati. The society is at 1916 Race St., Philadelphia 3.

WESTERN PLANT MAINTENANCE SHOW—July 12-14, Pan Pacific Auditorium, Los Angeles. Management: Clapp & Poliak, Inc., 341 Madison Ave., New York 17.

INSTRUMENT SOCIETY OF AMERICA—10th annual conference and exhibit. September 12-16, Shrine Exposition Hall and Shrine Auditorium, Los Angeles. Show office: 3443 S. Hill St., Los Angeles 7.

9TH EXPOSITION OF THE AIR CONDITIONING AND REFRIGERATION INDUSTRY—November 28-December 1, 1955, Atlantic City. The exposition is sponsored by the Air-Conditioning and Refrigeration Institute, 1346 Connecticut Ave., N.W., Washington.



WILSON
CENTRIFUGAL
BLOWDOWN
SEPARATORS

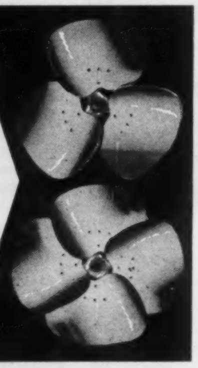
Write for Bulletin 30. Gives complete details and simple installation diagrams.

Solve Blowdown Problems
—NO TANKS NEEDED!

Wilson Centrifugal Blowdown Separators permit direct drainage of boiler blowdown to sewer, or other disposal, at atmospheric pressure. Flash steam and pressure are relieved through a large vent without entrapped water or objectional noise.

Installation of separators can be made wherever convenient—at the boiler, on boiler house roof, or outside the boiler house walls. Size of boiler blowdown connection determines which of two models (shown in Bulletin 30) is required. Separators are used, instead of blowdown tanks, in 47 states, foreign countries, and overseas military bases.

WILSON ENGINEERING CORPORATION
122 So. Michigan Ave., Dept. H-21, Chicago 3, Ill.



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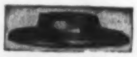
BURDEN

1940-50 Pontius Ave
LOS ANGELES, 25, CAL.

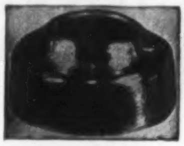
PIPE WELDING CLAMPS THAT MAKE WELDING PAY
- Pipe Clamps
- Flange Clamps
- Elbow Clamps
- Angle Clamps
- Pipe Markers

TWO SIZES
½ to 8 in. 8 to 16 in.
Light—Adjustable—Fast

The Jewel System of Pipe and Fitting Erection Ready for the Weld
Keeps the Welder Welding Instead of Waiting
CUTS ERECTION COSTS
Modernize Your Own Methods and Tool Equipment
JEWEL MANUFACTURING COMPANY
1841 University Ave., St. Paul, Minn.



No. 1
Made solid only
Flat Type



No. 36A
Made split or solid
Clears sleeve 1" high

"RITTER" CAST FLOOR & CEILING PLATES
CAST IRON & CAST BRASS

Ritter Floor & Ceiling Plates are solidly constructed, well designed, and superbly finished. Ritter plates meet City, State & Federal Specifications. We stock all sizes and styles, split or solid; in plain, Nickel or Chrome Plated finish from 1/4" to 12" pipe size. Any special sizes, heights or shapes can be furnished.

Ritter plates have been furnished for: V A Hopitals, Schools, Housing Projects, Terminals, Office Buildings and the United Nations.

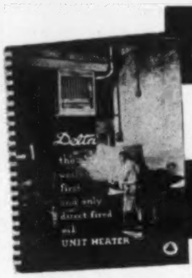
Other "Ritter" Products — Tunnel Stanchions, Pipe Rolls, Cast Iron Screwed Flanges and other Piping Specialties.

Write For Circulars

RITTER PATTERN & CASTING CO., INC.
120 WALKER STREET, NEW YORK, N. Y.

No. 3A
Made split or solid
Clears sleeve 1/4" high

No. 7
Made in two halves. Held by two screws. All dimensions to specifications.



See us at the Heating & Ventilating Exposition Booth 150 — Commercial Museum, Phila. Jan. 24-28

FREE COLORFUL CATALOG!

Just out . . . packed with photos and valuable information on **OIL-FIRED UNIT HEATERS**

How they work . . . how and where to install . . . how to estimate and how to order.

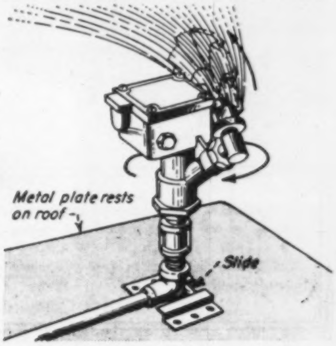
SEND FOR CATALOG UH-156 NOW!

DELTA HEATING CORPORATION,
TRENTON 8, NEW JERSEY

AUTOMATIC D HEATING

COOL any building from the **ROOF**

effectively
efficiently
economically


Metal plate rests on roof
Slide

RUPPRIGHT'S ROTARY ROOF COOLER
Box 6795 Los Angeles 22, Cal.

CLASSIFIED ADVERTISING

Classified Section: Rates for classified advertising are 15 cents for each word, including heading and address. One inch $7.00. Count nine words for keyed address. Minimum $2.50 for each insertion. Cash must accompany order.

agents wanted . . .

Manufacturer's Agents required by well known manufacturer of STEAM, GAS AND OIL FIRED UNIT HEATERS. HEATING AND VENTILATING UNITS. CONVECTOR RADIATORS. Territories open in several sections of the United States. Airtherm Manufacturing Company, 711 South Spring Avenue, St. Louis 10, Missouri.

MANUFACTURERS' AGENT WANTED—Manufacturer of well established, nationally advertised ceiling air diffuser has a few excellent territories available and is seeking a representative having fan, filters, and refrigeration equipment as related lines. This is a patented unit without competition and presents a fine opportunity for a qualified agent. Address Key 1122A, Heating, Piping & Air Conditioning, 6 North Michigan Avenue, Chicago 2, Illinois.

Nationally known manufacturer of quality gas fired cast iron boilers and steel residential and commercial boilers desires manufacturer's agency representation for the following territories: Chicago, Milwaukee, St. Louis, Detroit, Cleveland, Albany, Memphis, Indiana, West Virginia. Attractive commission arrangement and sales promotion program. Write Key 1136A, Heating, Piping & Air Conditioning, 6 North Michigan Avenue, Chicago 2, Ill.

Situations open . . .

REFRIGERATION ENGINEER required to assume responsibility of Sales Application Department. Must have knowledge of heat transfer, plus proven ability to translate technical engineering data and ratings into informative pieces used by the Sales Department. Not less than five years experience required with mechanical engineering degree or equivalent and field sales training experience. Preferably not over forty years old. Reply to Personnel Director, Acme Industries, Inc., 600 North Mechanic Street, Jackson, Michigan.

WANTED—Two District Sales Managers. One now located in Metropolitan New York Area and one in San Francisco. To supervise Sales Office of prominent manufacturer of Heating, Cooling and Air Conditioning equipment on East and West Coast areas. Send complete resume of education, experience, and salary requirements, to Key 1132A, Heating, Piping & Air Conditioning, 6 North Michigan Avenue, Chicago 2, Ill.

FIELD ENGINEER: Technical graduate, 25 to 30 years of age with experience in refrigeration and air conditioning to call on manufacturers, wholesalers, and contractors after indoctrination and factory training program. Salary plus liberal bonus arrangement. Please give details of past and present employment and education in first letter. Your application will be kept confidential. Write Key 1135A, Heating, Piping & Air Conditioning, 6 North Michigan Avenue, Chicago 2, Ill.

agent wanted . . .

Experienced Salesman: Northern Ohio Territory available for nationally known and established line of Ventilating Fans, Blowers and Unit Heaters. 28-35 years, must have had experience with architects, engineers or heating and ventilating contractors. Write — Sales Manager, Massachusetts Blower Division, The Bishop & Babcock Mfg. Co., 4901 Hamilton Ave., Cleveland 14, Ohio.

situations wanted . . .

MECHANICAL ENGINEER, graduate, ASHVE MEMBER, married, age 36, with varied experience in design, estimating, supervision of large central-station air conditioning, refrigeration, heating systems, also plumbing, piping design. Currently employed but desires more challenging position with contractor, consultant or manufacturer. Address Key 1133A, Heating, Piping & Air Conditioning, 6 North Michigan Avenue, Chicago 2, Ill.

Research project engineer has over seven years design and development experience with nationally know manufacturer. Primarily gas fired furnaces and boilers, oil application and air conditioning. BSME, PE. Available for supervisory position. Address Key 1134A, Heating, Piping & Air Conditioning, 6 North Michigan Avenue, Chicago 2, Ill.

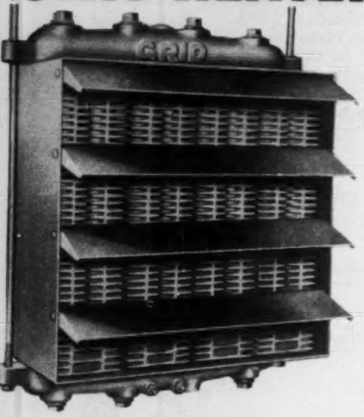
lines wanted . . .

Manufacturers' agent, Metropolitan New York City and Northern New Jersey, needs an additional line of refrigeration or air conditioning equipment. Alex. J. Wason, P. O. Box No. 1, River Edge, New Jersey.

. . . . are you looking around for items or personnel? A simple classified advertisement in here will help quickly and at low cost.

GRID
UNIT HEATERS and BLAST COILS

PUT UP TO STAY UP!



25 years of service without repairs or other maintenance . . . that's the record of GRID Unit Heaters. Only a GRID installation can provide that low cost service record. Here's why

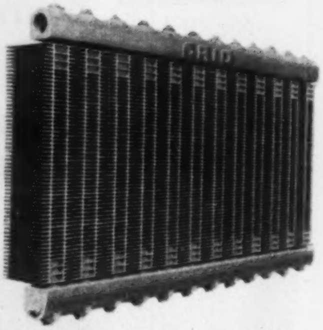
GRID is an all cast unit with finned heating sections and headers tested to withstand steam pressures up to 250# P.S.I.

GRID construction uses no brazed, soldered, rolled or welded connections between condenser and headers. A specially designed threaded nipple assures a precision, leak-proof fit.

GRID construction has all similar metals in contact with steam, thus preventing electrolytic corrosion which eventually occurs in copper type unit heaters where steam passes from iron pipes into copper cores. (Write for booklet CORROSION IN UNIT HEATERS.)

GRID construction resists corrosion from fumes present in most types of industry.

GRID design incorporating low outlet temperatures, proper fan sizes and motor speeds, assures delivery of warm comfortable air in ample volume to the working level. No stratification of warm air at the ceiling to waste your fuel dollars.

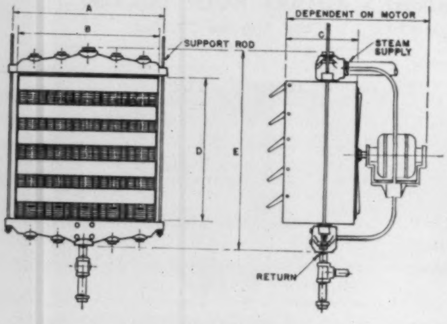


GRID Blast sections have the same high efficiency and lasting qualities as GRID Unit Heaters . . . no tortuous air passages . . . complete absence of rupture, strain and warping . . . guaranteed for steam pressures up to 250 lbs.

Hundreds of manufacturers are saving thousands of dollars in fuel and maintenance costs because theirs is a GRID installation. If it is GRID it's "Put Up To Stay Up" . . . no other unit heater has its lasting qualities.

GRID UNIT HEATERS HUNG IN 1929 ARE STILL OPERATING TODAY....

- *LARGER AIR VOLUME*
- *LOW MAINTENANCE EXPENSE*
- *MORE AIR CHANGES PER HOUR*
- *LONG LIFE*



Overall dimensions for installation of Cast Iron GRID Unit Heater

CAST IRON HEATING SECTIONS

ONE PIECE CONSTRUCTION - NO SOLDERED, BRAZED, WELDED, OR EXPANDED CONNECTIONS....

CI (CAST IRON) SERIES GRID UNIT HEATER DATA

Model No.	Dimensions A	B	C	D	E	Motor HP	RPM	Vol. Fan CFM	Capacities 5 PSI Steam 60°F Air Btu/Hr.	Final Temp °F	Pipe Size Supply	Return	Support Rod Dia.	Approx. Ship. Weight Lbs.
CI-1000	11⅝	10½	12¼	10 7/16	17¼	1/20	1550	572	29,080	106	1¼	1¼	½	150
CI-1200	14⅛	13⅛	12¼	13 5/16	21½	1/12	1700	798	45,450	112	1¼	1¼	½	210
CI-1500	17½	15⅜	11½	16	23⅞	⅛	1750	1500	76,500	107	1½	1½	½	280
CI-1520	17½	15⅜	11½	21	28⅜	⅛	1750	1700	101,500	114	1½	1½	½	390
CI-2000	22⅛	20 9/16	11⅞	21 1/16	28⅜	1/6	1150	2600	143,000	110	2	1½	½	490
CI-2025	22⅛	20 9/16	11⅞	25⅞	35¼	1/6	1150	2875	173,640	115	2	1½	½	520
CI-2500	27½	25⅞	13	25⅞	35¼	½	1150	4350	224,000	107	2	1½	⅝	700
CI-2504	27½	25⅞	13	25⅞	35¼	¼	1150	3300	206,000	117	2	1½	⅝	660
CI-2530	27½	25⅞	13	31	40½	½	1150	4650	275,800	114	2	1½	⅝	900
CI-3000	32⅝	31	13	31	40½	½	850	6300	332.000	108	2½	1½	⅝	1020
CI-3000	32⅝	31	13	31	40½	1½	1150	8000	380,000	103	2½	1½	⅝	1070

OFFICES IN PRINCIPAL CITIES

T.M. REG. U.S. PAT. OFF.

D. J. MURRAY MANUFACTURING CO.

WAUSAU, WISCONSIN

Write for complete catalog information on GRID Unit Heaters, GRID Blast Coils, and GRID Radiation.

SECTION OF JANUARY 1955 HEATING, PIPING & AIR CONDITIONING

1955 DIRECTORY

Heating, Piping and Air Conditioning Equipment for Industrial, Commercial, Institutional and Public Buildings

PART 1—Products Advertised In This Issue—Page 2d

For the names of the manufacturers of products advertised in this issue, look in Part 1, where the advertised products are classified in "directory style" with the noun governing. For the page on which you will find the advertising of manufacturers in this issue, see the last two pages of this yellow Directory Section.

PART 2—All Products Classified—Page 14d

If you want to know the names of one or more manufacturers making a certain product, look in Part 2, where all products are classified alphabetically in "directory style" with the noun governing (for instance, "unit heaters" are listed under "heaters, unit").

PART 3—All Trade Names—Page 104d

If you have the trade name of a product and want to know who manufactures it, look in Part 3, where trade names are alphabetically listed. Trade names the same as or identifiable from the company name are not listed. Manufacturers with such trade names can be easily identified under their product classifications in Parts 1 and 2.

Part 4—All Manufacturers' Addresses—Page 124d

For the complete name and address of any manufacturer, look in Part 4.

Heating, Piping & Air Conditioning
6 N. Michigan Ave.
Chicago 2, Illinois

DIRECTORY SECTION

HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRY AND LARGE BUILDINGS

PART 1—PRODUCTS ADVERTISED IN THIS ISSUE

The products classified in this Part 1 of the Directory Section are only those advertised in this issue. For the complete listings of these and other products made by all manufacturers, see Part 2, starting on page 14d. For the pages on which you will find the advertising of manufacturers in this issue, see the Index to Advertisers on the last two pages of this yellow Directory Section.

ABSORBERS, VIBRATION, FOR REFRIGERANT LINES

PACKLESS METAL HOSE, INC.
VIBRATION MOUNTINGS, INC.

ADHESIVES, FOR INSULATION

DEVICES, INC.
GRANT WILSON, INC.
MIRACLE ADHESIVES CORP.

ADHESIVES, FOR PIPE COVERING

DEVICES, INC.
MIRACLE ADHESIVES CORP.

ALARMS, HIGH AND LOW BOILER WATER

McDONNELL & MILLER, INC.

ALARMS, SMOKE

HEAT-TIMER CORP.

BASES AND PADS, VIBRATION ISOLATING

KORFUND CO., INC., THE
VIBRATION MOUNTINGS, INC.

BEARINGS, BALL

SEALMASTER BEARINGS, DIV. OF STEPHENS-ADAMSON MFG. CO.

BEARINGS, PILLOW BLOCK

LAU BLOWER CO., THE
SEALMASTER BEARINGS, DIV. OF STEPHENS-ADAMSON MFG. CO.

BEARINGS, SLEEVE

LAU BLOWER CO., THE

BENDERS, PIPE

GREENLEE TOOL CO.

BENDERS, TUBING

GREENLEE TOOL CO.

BLADES, PROPELLER FAN

BURDEN CO., ALAN E.
KODY BLOWER CO.

BLOWERS, HIGH PRESSURE

BAYLEY BLOWER CO.
BUFFALO FORGE CO.
CLARAGE FAN CO.
ELLIOTT CO.
JOY MFG. CO.
WING MFG. CO., L. J.

BOARDS, PANEL AND CONTROL

WILL-BURT CO., THE

BOILERS, HEATING, CAST IRON, SECTIONAL

SMITH CO., INC., THE H. B.

BOILERS, HEATING, STEEL, FIRE TUBE

ALDRICH CO.
FARRAR & TREFTS, INC.
SPENCER HEATER, LYCOMING DIV., AVCO MFG. CORP.
TITUSVILLE IRON WORKS CO., THE

BOILERS, HEATING, STEEL, WATER TUBE

RITE ENGINEERING & MFG. CORP.

BOILERS, PACKAGED UNITS, HEATING AND PROCESS—including Controls, Feed Pump, etc.

AMES IRON WORKS, INC.
BABCOCK & WILCOX CO.
FARRAR & TREFTS, INC.
KEWANEE-ROSS CORP.
ORR & SEMBOWER, INC.
PREFERRED UTILITIES MFG. CORP.
SELLERS ENGINEERING CO.
SUPERIOR COMBUSTION INDUSTRIES, INC.

BREAKERS, VACUUM

WATTS REGULATOR CO.

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL

GORDON & PIATT
METTLER CO., INC., THE
ROBERTS-GORDON APPLIANCE CORP.
SELLERS ENGINEERING CO.

BURNERS, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL

BEST COMBUSTION EQUIPMENT CO., INC., W. N.
METTLER CO., INC., THE
PREFERRED UTILITIES MFG. CORP.
ROBERTS-GORDON APPLIANCE CORP.
WEBSTER ENGINEERING CO., THE

BURNERS, OIL, COMMERCIAL AND INDUSTRIAL

BEST COMBUSTION EQUIPMENT CO., INC., W. N.
CLEAVER-BROOKS CO.
PETRO
PREFERRED UTILITIES MFG. CORP.
RAY OIL BURNER CO.

BURNERS, PULVERIZED COAL, COMMERCIAL AND INDUSTRIAL

BITUMINOUS COAL INSTITUTE

CALCULATORS, HEATING

MORTON, PAUL S.

CEMENT AND COMPOUNDS, PIPE JOINT

KEY CO.

CEMENT, INSULATING

MUNDET CORK CORP.

CHANGERS, SPEED, HYDRAULIC COUPLINGS

AMERICAN BLOWER CORP.

CHILLERS, WATER, FOR AIR CONDITIONING AND REFRIGERATION

ACME INDUSTRIES, INC.
BELL & GOSSETT CO.
DAVIS ENGINEERING CORP.
HEAT-X, INC.
KENNARD CORP.
TACO HEATERS, INC.
VILTER MFG. CO., THE
WHITLOCK MFG. CO., THE
YORK CORP.
YULA WATER HEATERS, INC.

CIRCULATORS FOR HOT WATER HEATING SYSTEMS

BELL & GOSSETT CO.
CHICAGO PUMP CO.
DUNHAM CO., C. A.
TACO HEATERS, INC.
WHEELER MFG. CO., C. H.

CLAMPS, BEAM, PIPE HANGING

GRABLER MFG. CO., THE
UNISTRUT PRODUCTS CO.

CLAMPS, PIPE, WELDING

JEWEL MFG. CO.

CLEANERS, AIR, ELECTRICAL

AMERICAN AIR FILTER CO., INC.
DOLLINGER CORP.
TRION, INC.
WESTINGHOUSE ELECTRIC CORP.

CLEANERS, TUBE

ELLIOTT CO.

COATINGS, PROTECTIVE, FOR METALS

TAPECOAT CO., THE

COILS, CONDENSATION

YULA WATER HEATERS, INC.

COILS AND PANELS, RADIANT HEATING AND COOLING, PREFABRICATED

BURGESS-MANNING CO., ARCHITECTURAL PRODUCTS DIV.
KRITZER RADIANT COILS, INC.
OLIN MATHIESON CHEMICAL CORP.

COILS, FOR HOT WATER STORAGE TANKS

DAVIS ENGINEERING CORP.
TACO HEATERS, INC.
YULA WATER HEATERS, INC.

COILS, PIPE

BLAW-KNOX CO., POWER PIPING AND SPRINKLER DIV.
GRINNELL CO., INC.
REMPE CO.
VILTER MFG. CO., THE

COLLECTORS, DUST

AMERICAN AIR FILTER CO., INC.

COMPRESSORS, AIR

JOY MFG. CO.

COMPRESSORS, REFRIGERATING, CENTRIFUGAL

TRANE CO., THE
WORTHINGTON CORP.
YORK CORP.

COMPRESSORS, REFRIGERATING, COMBINED WITH CONDENSER, WATER CHILLER, PIPING CONNECTIONS, AND CONTROLS

CARRIER CORP.
HEAT-X, INC.
TRANE CO., THE
VILTER MFG. CO., THE
YORK CORP.

COMPRESSORS, REFRIGERATING, RECIPROCATING

AIRTEMP DIV. OF CHRYSLER
BRUNNER MFG. CO.
COPELAND REFRIGERATION CORP.
FRICK CO.
VILTER MFG. CO., THE
YORK CORP.

COMPRESSORS, REFRIGERATING, STEAM JET

WHEELER MFG. CO., C. H.

CONCRETE, INSULATING, FOR UNDERGROUND PIPING

ZONOLITE CO., "Z" CRETE DIV.

CONDENSERS, REFRIGERATING, AIR COOLED

KRAMER TRENTON CO.

CONDENSERS, REFRIGERATING, EVAPORATIVE

BALTIMORE AIRCOIL CO., INC.
BUSH MFG. CO.
GOVERNAIR CORP.
KENNARD CORP.
MARLO COIL CO.
VILTER MFG. CO., THE

CONDENSERS, REFRIGERATING, SHELL AND COIL

ACME INDUSTRIES, INC.
DAVIS ENGINEERING CORP.
YULA WATER HEATERS, INC.

CONDENSERS, REFRIGERATING, SHELL AND TUBE

ACME INDUSTRIES, INC.
BELL & GOSSETT CO.
DAVIS ENGINEERING CORP.
VILTER MFG. CO., THE
YORK CORP.
YULA WATER HEATERS, INC.

CONDENSERS, STEAM

WHEELER MFG. CO., C. H.

CONDUIT, UNDERGROUND PIPING

DURANT INSULATED PIPE CO.
DURANT INTERNATIONAL CORP.
PORTER & CO., INC., H. W.
RIC-WIL, INC.
UNIVERSAL SEWER PIPE CO.
ZONOLITE CO., "Z" CRETE DIV.

CONNECTIONS, DUCT, FLEXIBLE (ASBESTOS, CANVAS, ETC.)

DURO-DYNE CORP.
ELGEN MFG. CORP.
FLEXAUST CO., THE
FLEXIBLE TUBING CORP.
GRANT WILSON INC.
WIREMOLD CO.

CONTROL, FOR INDIRECT WATER HEATERS

PERFEX CORP.

CONTROLLERS AND STARTERS, MOTOR

ALLEN-BRADLEY CO.
FURNAS ELECTRIC CO.

CONTROLS, DRAFT, BAROMETRIC

FIELD CONTROL DIV., H. D. CONKEY & CO.
PERFEX CORP.
PREFERRED UTILITIES MFG. CORP.

CONTROLS, FLAME FAILURE

COMBUSTION CONTROL DIV., ELECTRONICS CORP. OF AMERICA
PERFEX CORP.
WEBSTER ENGINEERING CO., THE
WHEELCO INSTRUMENTS DIV., BARBER-COLMAN CO.

CONVERTORS, STEAM

BELL & GOSSETT CO.
DAVIS ENGINEERING CORP.
RICHMOND ENGINEERING CO.
TACO HEATERS, INC.
YULA WATER HEATERS, INC.

CONVEYORS, COAL AND ASH

BITUMINOUS COAL INSTITUTE
CANTON STOKER CORP.

COOLERS, OIL

DAVIS ENGINEERING CORP.
TACO HEATERS, INC.

COOLERS, UNIT (SUSPENDED TYPE)

REMPE CO.

COUPLINGS, FLEXIBLE, POWER TRANSMISSION

DODGE MFG. CORP.
WALDRON CORP., JOHN

COUPLINGS, PIPE

GUSTIN-BACON MFG. CO.

CUT-OFFS, LOW WATER, HEATING BOILER

MAID-O'-MIST, INC.
McDONNELL & MILLER, INC.
WATTS REGULATOR CO.

CUTTERS, PIPE

TOLEDO PIPE THREADING MACHINE CO.

DAMPERS, DUCT, MANUALLY OPERATED

AIR-FACTORS, INC.
AIR-PATH PRODUCTS CO.
GENERAL REGISTER CORP.
POWERS REGULATOR CO., THE
TITUS MFG. CORP.

DAMPERS, DUCT, REMOTE CONTROLLED

POWERS REGULATOR CO., THE

DEAERATORS

ELLIOTT CO.

DEHUMIDIFIERS, ABSORPTION AND ADSORPTION

NIAGARA BLOWER CO.
PRITCHARD & CO. OF CALIFORNIA, J. F.
SURFACE COMBUSTION CORP.

DEHUMIDIFIERS FOR COMPRESSED AIR

PRITCHARD & CO. OF CALIFORNIA, J. F.

DEHUMIDIFIERS, SPRAYED COIL

AIR & REFRIGERATION CORP.
KENNARD CORP.
YORK CORP.

DEHYDRATORS, REFRIGERANT

HENRY VALVE CO.
SPORLAN VALVE CO.

DESTROYERS, SOOT, CHEMICAL

METROPOLITAN REFINING CO., INC.

DETECTORS, LEAK, FUEL OIL

TECHNIFLEX CORP.

DIFFUSERS, AIR, CEILING

AIR DEVICES, INC.
AIR-FACTORS, INC.
BARBER-COLMAN CO.
CARNES CORP.
MULTI-VENT DIV., THE PYLE-NATIONAL CO.
TUTTLE & BAILEY, INC.
UNIVERSAL DIFFUSER CORP.

DIFFUSERS, AIR, FLOOR

A-J MFG. CO.

DIFFUSERS, AIR, HIGH PRESSURE

ANEMOSTAT CORP. OF AMERICA
BARBER-COLMAN CO.
TITUS MFG. CORP.
TUTTLE & BAILEY, INC.
UNIVERSAL DIFFUSER CORP.

DIFFUSERS, AIR, WALL

AIR DEVICES, INC.
AIR-FACTORS, INC.
A-J MFG. CO.
BARBER-COLMAN CO.
TITUS MFG. CORP.
UNIVERSAL DIFFUSER CORP.

DISTRIBUTORS, REFRIGERANT, FOR COOLING COILS

SPORLAN VALVE CO.

DOORS AND PANELS, ACCESS

AIR-PATH PRODUCTS CO.

DRYERS, INDUSTRIAL

AIR & REFRIGERATION CORP.

DUCTS AND DUCT FITTINGS, PREFABRICATED, NON-METALLIC

FLEXAUST CO., THE
FLEXIBLE TUBING CORP.
WIREMOLD CO.

ECONOMIZERS, FUEL

RICHMOND ENGINEERING CO.

EJECTORS, SEWAGE

CHICAGO PUMP CO.
YEOMANS BROS. CO.

ELBOWS, BALANCING, FOR HOT WATER HEATING SYSTEMS

BELL & GOSSETT CO.
SARCOTHERM CONTROLS, INC.

ELECTRODES, ARC WELDING

HOBART BROS. CO.

ELIMINATORS, AIR, FOR HEATING AND PIPING SYSTEMS

GORTON HEATING CORP.
MAID-O'-MIST, INC.
SARCO CO., INC.
WEBSTER & CO., WARREN

ENCLOSURES, RADIATOR

STEDCO PRODUCTS

EXCHANGERS, HEAT

BELL & GOSSETT CO.
DAVIS ENGINEERING CORP.
OLIN MATHIESON CHEMICAL CORP.
PERFEX CORP.
POWERS REGULATOR CO., THE
PRITCHARD & CO. OF CALIFORNIA, J. F.
TACO HEATERS, INC.
YULA WATER HEATERS, INC.

FANS, AXIAL FLOW, PRESSURE TYPE

BUFFALO FORGE CO.
DEBOTHEZAT FANS DIV. AMERICAN MACHINE & METALS, INC.
JOY MFG. CO.
KODY BLOWER CO.
SOUTH BEND AIR PRODUCTS, INC.
WING MFG. CO., L. J.

FANS, CENTRIFUGAL

ALADDIN HEATING CORP.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
AMERICAN BLOWER CORP.
BAYLEY BLOWER CO.
BISHOP & BABCOCK MFG. CO., THE
BUFFALO FORGE CO.
CLARAGE FAN CO.
GENERAL BLOWER CO.
HARTZELL PROPELLER FAN CO.
ILG ELECTRIC VENTILATING CO.
LAU BLOWER CO., THE
MORRISON PRODUCTS, INC.
NEW YORK BLOWER CO.
UTILITY FAN CORP.
WESTINGHOUSE ELECTRIC CORP.

FANS, MECHANICAL DRAFT, FOR BOILERS

BUFFALO FORGE CO.
CLARAGE FAN CO.
WING MFG. CO., L. J.

FANS, PROPELLER

AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
AMERICAN BLOWER CORP.
BISHOP & BABCOCK MFG. CO., THE
BUFFALO FORGE CO.
CLARAGE FAN CO.
HARTZELL PROPELLER FAN CO.
ILG ELECTRIC VENTILATING CO.
JENN-AIR PRODUCTS CO., INC.
KODY BLOWER CO.
LAU BLOWER CO., THE
SOUTH BEND AIR PRODUCTS INC.

FASTENERS, INSULATION

DEVICES, INC.
GRAHAM MFG. CORP.
MIRACLE ADHESIVES CORP.

FASTENERS, POWDER ACTUATED

RAMSET DIV., OLIN MATHIESON CHEMICAL CORP.
REMINGTON ARMS CO., INC.

FEEDERS, WATER, HEATING BOILER

MAID-O'-MIST, INC.
McDONNELL & MILLER, INC.
WATTS REGULATOR CO.

FILTERS, AIR, AUTOMATIC

AMERICAN AIR FILTER CO., INC.
CONTINENTAL AIR FILTERS, INC.
DOLLINGER CORP.
TRION, INC.

FILTERS, AIR, GREASE

CONTINENTAL AIR FILTERS, INC.
EVANS CORP., THE GEORGE

FILTERS, AIR, UNIT, CLEANABLE

AIR DEVICES, INC.
AMERICAN AIR FILTER CO., INC.
CONTINENTAL AIR FILTERS, INC.
DOLLINGER CORP.
EVANS CORP., THE GEORGE
FARR CO.

FILTERS, AIR, UNIT, ELECTROSTATIC, SELF-CHARGING

AMERICAN AIR FILTER CO., INC.

FILTERS, AIR, UNIT, RENEWABLE MEDIA

AMERICAN AIR FILTER CO., INC.
CONTINENTAL AIR FILTERS, INC.
DOLLINGER CORP.

FILTERS, AIR, UNIT, THROW-AWAY

AMERICAN AIR FILTER CO., INC.

FILTERS, REFRIGERANT

ALCO VALVE CO.
HENRY VALVE CO.
SPORLAN VALVE CO.

FITTINGS, COPPER TUBE, SOLDER

CHASE BRASS & COPPER CO.
GRABLER MFG. CO.

FITTINGS, HOT WATER HEATING SYSTEM, ONE PIPE

BELL & GOSSETT CO.

FITTINGS, LINED

LAFAVORITE RUBBER MFG. CO.

FITTINGS, PIPE, BRONZE, SOLDER

GRABLER MFG. CO.

FITTINGS, PIPE, MALLEABLE

GRABLER MFG. CO.

FITTINGS, PIPE, PLASTIC

COLONIAL PLASTICS MFG. CO., SUBSIDIARY OF THE VAN DORN IRON WORKS CO.
HARTWELL & SON, INC., H. N.

FITTINGS, PIPE, STAINLESS STEEL

WATSON-STILLMAN FITTINGS DIV., H. K. PORTER CO., INC.

FITTINGS, PIPE, STAINLESS STEEL, WELDING

PYPON CO., THE

FITTINGS, PIPE, STEEL, FORGED, THREADED

WATSON-STILLMAN FITTINGS DIV., H. K. PORTER CO., INC.

FITTINGS, PIPE, STEEL, SOCKET WELD

WATSON-STILLMAN FITTINGS DIV., H. K. PORTER CO., INC.

FITTINGS, PIPE, WELDING

BONNEY FORGE & TOOL WORKS
GRINNELL CO., INC.
MIDWEST PIPING CO., INC.
TAYLOR FORGE & PIPE WORKS
TUBE TURNS

FLANGES, PIPE

GRINNELL CO., INC.
RITTER PATTERN & CASTING CO., INC.
TAYLOR FORGE & PIPE WORKS
TUBE TURNS

FLOATS

NICHOLSON & CO., W. H.

FURNACES, WARM AIR, FOR INDUSTRIAL AND LARGE BUILDING CENTRAL HEATING

CAMPBELL HEATING CO.
HAYES FURNACE MFG. & SUPPLY CO.
MAMMOTH FURNACE CO., INC.
NATIONAL HEATER CO., INC.

GAGES, INDICATING, DRAFT

CLEVELAND FUEL EQUIPMENT CO.

GAGES, INDICATING, PRESSURE

CLEVELAND FUEL EQUIPMENT CO.

GAGES, LIQUID LEVEL

HENRY VALVE CO.
LIQUIDEPTH INDICATORS, INC.

GAGES, OIL TANK

LIQUIDEPTH INDICATORS, INC.

GAGE SETS, REFRIGERATION

HENRY VALVE CO.

GOVERNORS, PUMP

BLACK, SIVALLS & BRYSON, INC.
LESLIE CO.
McDONNELL & MILLER, INC.

GRILLES

AIR-FACTORS, INC.
AIR-PATH PRODUCTS CO.
A-J MFG. CO.
BARBER-COLMAN CO.
DIAMOND MFG. CO.
GENERAL REGISTER CORP.
HENDRICK MFG. CO.
REGISTER & GRILLE MFG. CO., INC.
STEWART MFG. CO., INC.
TITUS MFG. CORP.
TUTTLE & BAILEY, INC.
WATERLOO REGISTER CO., INC.

HANGERS AND SUPPORTS, PIPE

BLAW-KNOX CO., POWER PIPING AND SPRINKLER DIV.
GRABLER MFG. CO., THE
GRINNELL CO., INC.
MINERALLAC ELECTRIC CO.
RITTER PATTERN & CASTING CO., INC.
UNISTRUT PRODUCTS CO.
VIBRATION MOUNTINGS, INC.

HEADERS, PIPE

BLAW-KNOX CO., POWER PIPING AND SPRINKLER DIV.
GRINNELL CO., INC.

HEADS, SAFETY

BLACK, SIVALLS & BRYSON, INC.

HEATERS, AIR, DIRECT FIRED, COAL

CAMPBELL HEATING CO.
OLSON & CO., ARTHUR A.

HEATERS, AIR, DIRECT FIRED, COMBINATION GAS AND OIL

AIRTHERM MFG. CO.
DRAVO CORP.
MAMMOTH FURNACE CO.
NATIONAL HEATER CO., INC.
OLSON & CO., ARTHUR A.

HEATERS, AIR, DIRECT FIRED, GAS, CENTRIFUGAL FAN TYPE

AIRTHERM MFG. CO.
CAMPBELL HEATING CO.
DRAVO CORP.
HAYES FURNACE MFG. & SUPPLY CO.
MAMMOTH FURNACE CO.
NATIONAL HEATER CO., INC.
OLSON & CO., ARTHUR A.
REZNOR MFG. CO.
ZINK CO., JOHN

HEATERS, AIR, DIRECT FIRED, OIL, FLOOR TYPE

AIRTHERM MFG. CO.
CAMPBELL HEATING CO.
DELTA HEATING CORP.
DRAVO CORP.
MAMMOTH FURNACE CO.
NATIONAL HEATER CO., INC.
OLSON & CO., ARTHUR A.

HEATERS, AIR, DIRECT FIRED, OIL, SUSPENDED TYPE

DELTA HEATING CORP.
DRAVO CORP.
MUELLER CLIMATROL
NATIONAL HEATER CO., INC.

HEATERS, DUCT, GAS

HAYES FURNACE MFG. & SUPPLY CO.
REZNOR MFG. CO.
ZINK CO., JOHN

HEATERS, INDIRECT, SUBMERGED

BELL & GOSSETT CO.
DAVIS ENGINEERING CORP.
YULA WATER HEATERS, INC.

HEATERS, RADIATION

TACO HEATERS, INC.

HEATERS, UNIT, ELECTRIC HEATING ELEMENT

ILG ELECTRIC VENTILATING CO.

HEATERS, UNIT, GAS, PROPELLER FAN TYPE

AIRTHERM MFG. CO.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
DRAVO CORP.
FEDDERS-QUIGAN CORP.
GRINNELL CO., INC.
ILG ELECTRIC VENTILATING CO.
JANITROL HEATING AND AIR CONDITIONING DIV., SURFACE COMBUSTION CORP.
MODINE MFG. CO.
MUELLER CLIMATROL
NESBITT, INC., JOHN J.
REZNOR MFG. CO.
WEBSTER & CO., WARREN
YOUNG RADIATOR CO.
ZINK CO., JOHN

HEATERS, UNIT, OIL, PROPELLER FAN TYPE

DELTA HEATING CORP.

HEATERS, UNIT, STEAM AND HOT WATER, CABINET TYPE

AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
IRON FIREMAN MFG. CO.
NESBITT, INC., JOHN J.
YOUNG RADIATOR CO.

HEATERS, UNIT, STEAM AND HOT WATER, CENTRIFUGAL FAN TYPE

AIRTHERM MFG. CO.
BISHOP & BABCOCK MFG. CO., THE
CLARAGE FAN CO.
DUNHAM CO., C. A.
KENNARD CORP.
NESBITT, INC., JOHN J.
WESTINGHOUSE ELECTRIC CORP.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, HORIZONTAL BLOW

AIRTHERM MFG. CO.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
AMERICAN BLOWER CORP.
CARRIER CORP.
CLARAGE FAN CO.
DUNHAM CO., C. A.
FEDDERS-QUIGAN CORP.
GRINNELL CO., INC.
HARTZELL PROPELLER FAN CO.
ILG ELECTRIC VENTILATING CO.
MODINE MFG. CO.
MURRAY MFG. CO., D. J.
NESBITT, INC., JOHN J.
TRANE CO., THE
WESTINGHOUSE ELECTRIC CORP.
WING MFG. CO., L. J.
YOUNG RADIATOR CO.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, VERTICAL BLOW

AIRTHERM MFG. CO.
CARRIER CORP.
CLARAGE FAN CO.
DUNHAM CO., C. A.
FEDDERS-QUIGAN CORP.
GRINNELL CO., INC.
ILG ELECTRIC VENTILATING CO.
MODINE MFG. CO.
NESBITT, INC., JOHN J.
TRANE CO., THE
YOUNG RADIATOR CO.
WING MFG. CO., L. J.

HEATERS, WALL CIRCULATING, GAS FIRED

ZINK CO., JOHN

HEATERS, WATER, AIR-TANKLESS

BELL & GOSSETT CO.

HEATERS, WATER, COAL, GAS, OR OIL FIRED

ALDRICH CO.
SMITH CO., INC., THE H. B.

HEATERS, WATER, GAS FIRED

SELLERS ENGINEERING CO.

HEATERS, WATER, INDIRECT

BELL & GOSSETT CO.
DAVIS ENGINEERING CORP.
SELLERS ENGINEERING CO.
TACO HEATERS, INC.
YULA WATER HEATERS, INC.

HEATERS, WATER, STEAM, INSTANTANEOUS

BELL & GOSSETT CO.
DAVIS ENGINEERING CORP.
RICHMOND ENGINEERING CO.
WHITLOCK MFG. CO., THE
YULA WATER HEATERS, INC.

HEATERS, WATER, STEAM, STORAGE

BELL & GOSSETT CO.
DAVIS ENGINEERING CORP.
PATTERSON-KELLEY CO., INC., THE
RICHMOND ENGINEERING CO.
WHITLOCK MFG. CO., THE

HOSE, FLEXIBLE METAL, AND FITTINGS

PACKLESS METAL HOSE, INC.
UNIVERSAL METAL HOSE CO.
VIBRATION MOUNTINGS, INC.

HOSE, NON-METAL, AND FITTINGS

FLEXAUST CO., THE

HOUSINGS, FAN, CENTRIFUGAL

MORRISON PRODUCTS, INC.
UTILITY FAN CORP.

HUMIDIFIERS, CENTRAL PLANT

BAHNSON CO.
McDONNELL & MILLER, INC.

HUMIDIFIERS, DIRECT, SPRAY HEAD

BAHNSON CO.

HUMIDIFIERS, RADIATOR VENT VALVE

MAID-O'-MIST, INC.

HUMIDIFIERS, UNIT, ROOM TYPE (without heating)

BAHNSON CO.

HUMIDISTATS

BARBER-COLMAN CO.
POWERS REGULATOR CO., THE

INDICATOR-CONTROLLERS, PRESSURE

POWERS REGULATOR CO., THE

INDICATOR-CONTROLLERS, RELATIVE HUMIDITY

POWERS REGULATOR CO., THE
TAYLOR INSTRUMENT COS.

INDICATOR-CONTROLLERS, TEMPERATURE

POWERS REGULATOR CO., THE
TAYLOR INSTRUMENT COS.

INDICATORS, LIQUID LEVEL, BOILER AND TANK

LIQUIDEPTH INDICATORS, INC.
McDONNELL & MILLER, INC.

INSERTS, CONCRETE

GRABLER MFG. CO., THE
UNISTRUT PRODUCTS CO.

INSULATION, BOILER AND TANK

MUNDET CORK CORP.

INSULATION, BUILDING

DEVICES, INC.
INFRA INSULATION, INC.
MIRACLE ADHESIVES CORP.

INSULATION, DUCT, SOUND DEADENING (FOR APPLICATION INSIDE DUCT)

GLASS FIBERS, INC.
GRANT WILSON, INC.
GUSTIN-BACON MFG. CO.
INDUSTRIAL SOUND CONTROL INC.
(packaged unit to incorporate in duct work)

INSULATION, DUCT, THERMAL

DEVICES, INC.
GLASS FIBERS, INC.
GRANT WILSON, INC.
GUSTIN-BACON MFG. CO.
MIRACLE ADHESIVES CORP.
MUNDET CORK CORP.

INSULATION, FINISHING CEMENT

MUNDET CORK CORP.

INSULATION, PIPE

BALDWIN-HILL CO.
DEVICES, INC.
DURANT INSULATED PIPE CO.
DURANT INTERNATIONAL CORP.
GLASS FIBERS, INC.
GUSTIN-BACON MFG. CO.
KEASBEY & MATTISON CO.
MIRACLE ADHESIVES CORP.
MUNDET CORK CORP.
ZONOLITE CO., "Z" CRETE DIV.

JOINTS, PIPE, EXPANSION, PACKLESS

BADGER MFG. CO.
FULTON SYLPHON DIV., ROBERTSHAW-FULTON CONTROLS CO.
LAFAVORITE RUBBER MFG. CO.

JOINTS, PIPE, EXPANSION, SLIP

WEBSTER & CO., WARREN
YARNALL-WARING CO.

LOUVERS AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

AIR-PATH PRODUCTS CO.
AIR & REFRIGERATION CORP.
SWARTWOUT CO., THE

MACHINES, PIPE CUTTING AND THREADING

TOLEDO PIPE THREADING MACHINE CO., THE

MARKERS, PIPE, HOLE AND SADDLE

JEWEL MFG. CO.

METERS, FLOW, STEAM

BUILDERS-PROVIDENCE, DIV. OF B-I-F INDUSTRIES, INC.

MOTORS, ELECTRIC, FRACTIONAL HP

BALDOR ELECTRIC CO.
BARBER-COLMAN CO.
DOERR ELECTRIC CORP.
WAGNER ELECTRIC CORP.

MOTORS, ELECTRIC, 1 HP AND OVER

BALDOR ELECTRIC CO.
CENTURY ELECTRIC CO.
DOERR ELECTRIC CORP.
ELLIOTT CO.
WAGNER ELECTRIC CORP.

NIPPLES, PIPE

GRABLER MFG. CO.
GRINNELL CO., INC.

NOISE ELIMINATION FOR COOLING TOWERS

INDUSTRIAL SOUND CONTROL, INC.

NOZZLES, ATOMIZING

MONARCH MFG. WKS., INC.

NOZZLES, OIL BURNER

MONARCH MFG. WKS., INC.

NOZZLES, SPRAY

BINKS MFG. CO.
MONARCH MFG. WKS., INC.
SPRAYING SYSTEMS CO.

OIL, FOR VISCOUS AIR FILTERS

CONTINENTAL AIR FILTERS, INC.

OPERATORS, DAMPER, DUCT

BARBER-COLMAN CO.
JOHNSON SERVICE CO.
POWERS REGULATOR CO., THE

OPERATORS, VALVE

BARBER-COLMAN CO.
JOHNSON SERVICE CO.
McDONNELL & MILLER, INC.
POWERS REGULATOR CO., THE

PANELS, PERFORATED, FOR AIR DIFFUSION

MULTI-VENT DIV., THE PYLE-NATIONAL CO.

PARTS FOR HEATING AND AIR CONDITIONING EQUIPMENT

AIR & REFRIGERATION CORP. (factory insulated panels)
DURO-DYNE CORP. (hardware and parts used in fabricating dampers and turning vanes)
PHOENIX PRODUCTS CO., METAL SPINNING DIV. (metal spinnings for fan housings, diffusers, etc.)

PIPE, BRASS AND COPPER

HUSSEY & CO., C. G.

PIPE, CAST IRON, PRESSURE, BELL AND SPIGOT

DURIRON CO., INC., THE (acid resisting)

PIPE, LINED

LAFAVORITE RUBBER MFG. CO.

PIPE, PLASTIC

COLONIAL PLASTICS MFG. CO., SUBSIDIARY OF THE VAN DORN IRON WORKS CO.
HARTWELL & SON, INC., H. N.

PIPE, PRE-INSULATED

DURANT INSULATED PIPE CO.
DURANT INTERNATIONAL CORP.
RIC-WIL INC.

PIPE, STEEL, BUTT AND LAP WELDED

NATIONAL TUBE DIV., UNITED STATES STEEL CORP.
SPANG-CHALFANT, DIV. OF NATIONAL SUPPLY CO.
WHEATLAND TUBE CO.
YOUNGSTOWN SHEET AND TUBE CO., THE

PIPE, STEEL, STAINLESS

PYPON CO., THE

PLATES, FLOOR AND CEILING

RITTER PATTERN & CASTING CO., INC.
WEBSTER & CO., WARREN

PREHEATERS, FUEL OIL

DAVIS ENGINEERING CORP.
PREFERRED UTILITIES MFG. CORP.
TACO HEATERS, INC.
WHITLOCK MFG. CO., THE
YULA WATER HEATERS, INC.

PROTECTORS, PIPE COVERING

BALDWIN-HILL CO.
DEVICES, INC.
MIRACLE ADHESIVES CORP.

PULLEYS AND SHEAVES, FOR BELT DRIVES

DODGE MFG. CORP.
LAU BLOWER CO., THE

PUMPS

DE LAVAL STEAM TURBINE CO. (General)

PUMPS, BOILER FEED

AMERICAN-MARSH PUMPS, INC.
CHICAGO PUMP CO.
EAGAN CO., INC., WALTER H.
McDONNELL & MILLER, INC.
ROTH CO., ROY E.
SKIDMORE CORP.

PUMPS, CENTRIFUGAL

AMERICAN-MARSH PUMPS, INC.
AURORA PUMP CO.
BELL & GOSSETT CO.
BUFFALO PUMPS, INC.
CARVER PUMP CO.
CHICAGO PUMP CO.
DEMING CO.
DUNHAM CO., C. A.
EAGAN CO., INC., WALTER H.
GOULDS PUMPS, INC.
INGERSOLL-RAND CO.
MYERS & BRO., THE F. E.
TACO HEATERS, INC.
WEINMAN PUMP MFG. CO.
WHEELER MFG. CO., C. H.
WORTHINGTON CORP.

PUMPS, CONDENSATION RETURN

CHICAGO PUMP CO.
EAGAN CO., INC., WALTER H.
ROTH CO., ROY E.
SKIDMORE CORP.
STERLING, INC.
WEIL PUMP CO.
WHEELER MFG. CO., C. H.

PUMPS, FIRE

AMERICAN-MARSH PUMPS, INC.
CHICAGO PUMP CO.
ECONOMY PUMPS, INC., DIV. OF C. H. WHEELER MFG. CO.

PUMPS, GEAR

AMERICAN HARD RUBBER CO.

PUMPS, LIQUID REFRIGERANT CIRCULATING

ROTH CO., ROY E.

PUMPS, RECIPROCATING

AMERICAN HARD RUBBER CO.

PUMPS, ROTARY

AMERICAN HARD RUBBER CO.
BLACKMER PUMP CO.
ROTH CO., ROY E.

PUMPS, SEWAGE AND SLUDGE

AMERICAN-MARSH PUMPS, INC.
CHICAGO PUMP CO.
YEOMANS BROS. CO.

PUMPS, STEAM

AMERICAN-MARSH PUMPS, INC.

PUMPS, SUMP

AMERICAN-MARSH PUMPS, INC.
CHICAGO PUMP CO.
ROTH CO., ROY E.
YEOMANS BROS. CO.

PUMPS, TURBINE TYPE

AMERICAN-MARSH PUMPS, INC.
EAGAN CO., INC., WALTER H.
ROTH CO., ROY E.
SKIDMORE CORP.

PUMPS, VACUUM

WHEELER MFG. CO., C. H.

PUMPS, VACUUM HEATING

CHICAGO PUMP CO.
DUNHAM CO., C. A.
NASH ENGINEERING CO.
SKIDMORE CORP.
STERLING, INC.
WHEELER MFG. CO., C. H.

PUMPS, VISCOUS LIQUIDS AND HEAVY MATERIALS

BLACKMER PUMP CO.

PUNCHES, SHEET METAL

DURO-DYNE CORP.
GREENLEE TOOL CO.

PUSHERS, PIPE, HYDRAULIC

GREENLEE TOOL CO.

RACKS, STORAGE, PIPE

UNISTRUT PRODUCTS CO.

RADIATION, BASEBOARD, FERROUS

FEDDERS-QUIGAN CORP.
KRITZER RADIANT COILS, INC.
SHAW-PERKINS

RADIATION, BASEBOARD, NON-FERROUS

DUNHAM CO., C. A.
FEDDERS-QUIGAN CORP.
HOFFMAN SPECIALTY MFG. CORP.
KRITZER RADIANT COILS, INC.
NESBITT, INC., JOHN J.
RADIANT-RAY RADIATION, INC.
STEDCO PRODUCTS
TUTTLE & BAILEY, INC.
WEBSTER & CO., WARREN
YOUNG RADIATOR CO.

RADIATION, CONVECTION, TYPE, FERROUS

KRITZER RADIANT COILS, INC.
MURRAY MFG. CO., D. J.
SHAW-PERKINS
WEBSTER & CO., WARREN

RADIATION, CONVECTION TYPE, NON-FERROUS

AIRTHERM MFG. CO.
DUNHAM CO., C. A.
FEDDERS-QUIGAN CORP.
HOFFMAN SPECIALTY MFG. CORP.
IRON FIREMAN MFG. CO.
KRITZER RADIANT COILS, INC.
NESBITT, INC., JOHN J.
TRANE CO., THE
TUTTLE & BAILEY, INC.
WEBSTER & CO., WARREN
YOUNG RADIATOR CO.

RADIATION, DIRECT

MURRAY MFG. CO., D. J.

RADIATION, FIN TUBE TYPE

DUNHAM CO., C. A.
FEDDERS-QUIGAN CORP.
HOFFMAN SPECIALTY MFG. CORP.
KRITZER RADIANT COILS, INC.
NESBITT, INC., JOHN J.
RADIANT-RAY RADIATION, INC.
SHAW-PERKINS
STEDCO PRODUCTS
WEBSTER & CO., WARREN

RECORDER-CONTROLLERS, HUMIDITY, PRESSURE, TEMPERATURE

HEAT-TIMER CORP.
POWERS REGULATOR CO., THE
TAYLOR INSTRUMENT COS.

RECORDERS, TEMPERATURE

ELECTRIC AUTO-LITE CO., THE,
INSTRUMENT & GAUGE DIV.

RECORDER-TOTALIZERS, HEAT

HEAT-TIMER CORP.

REFRIGERANTS

GENERAL CHEMICAL DIV., ALLIED
CHEMICAL & DYE CORP.

REGISTERS

AIR-FACTORS, INC.
A-J MFG. CO.
BARBER-COLMAN CO.
GENERAL REGISTER CORP.
INDEPENDENT REGISTER CO., THE
REGISTER & GRILLE MFG. CO., INC.
STEWART MFG. CO., INC.
TITUS MFG. CORP.
TUTTLE & BAILEY, INC.
WATERLOO REGISTER CO., INC.

REGULATORS, DAMPER SETS

DURO-DYNE CORP.

REGULATORS, DRAFT, COMBUSTION

CLEVELAND FUEL EQUIPMENT CO.
FIELD CONTROL DIV., H. D.
CONKEY & CO.
PERFEX CORP.
WEBSTER ENGINEERING CO., THE

REGULATORS, LEVEL, LIQUID

ALCO VALVE CO.
BLACK, SIVALLS & BRYSON, INC.
McDONNELL & MILLER, INC.

REGULATORS, PRESSURE, AIR

KECKLEY CO., O. C.
McDONNELL & MILLER, INC.

REGULATORS, PRESSURE, GAS

KECKLEY CO., O. C.

REGULATORS, PRESSURE, HOT WATER HEATING SYSTEM

BELL & GOSSETT CO.
McDONNELL & MILLER, INC.
POWERS REGULATOR CO., THE
WATTS REGULATOR CO.
WEBSTER & CO., WARREN

REGULATORS, PRESSURE, LIQUID

BLACKMER PUMP CO..
BLACK, SIVALLS & BRYSON, INC.
KECKLEY CO., O. C.
LESLIE CO.
McDONNELL & MILLER, INC.
WATTS REGULATOR CO.

REGULATORS, STATIC PRESSURE, AIR DUCT

POWERS REGULATOR CO, THE

REGULATORS, TEMPERATURE

ALLEN-BRADLEY CO.
BARBER-COLMAN CO.
BELL & GOSSETT CO.
JOHNSON SERVICE CO.
KECKLEY CO., O. C.
LESLIE CO.
MERCOID CORP., THE
McDONNELL & MILLER, INC.
PERFEX CORP.
POWERS REGULATOR CO., THE
SARCO CO., INC.
SARCOTHERM CONTROLS, INC.
SPENCE ENGINEERING CO., INC.
STERLING, INC.
WATTS REGULATOR CO.

RELAYS, ELECTRICAL

PERFEX CORP.

SCOOPS, AIR, FOR DEFLECTING FLOW IN DUCTS

GENERAL REGISTER CORP.
TITUS MFG. CORP.
WATERLOO REGISTER CO., INC.

SEPARATORS, BLOWDOWN

WILSON ENGINEERING CORP.

SEPARATORS, OIL

TECHNIFLEX CORP.

SETS, PIPE BIT, FOR BORING HOLES IN WOOD FOR PIPE AND TUBING

GREENLEE TOOL CO.

SHEARS, ELECTRIC, PORTABLE

BLACK & DECKER MFG. CO., THE

SHEETS AND BOARD, NON-METALLIC, FOR DUCT CONSTRUCTION

COLONIAL PLASTICS MFG. CO.,
SUBSIDIARY OF THE VAN DORN
IRON WORKS CO.
HARTWELL & SON, INC., H. N.

SHEETS, COPPER

HUSSEY & CO., C. G.

SHEETS, STEEL, COPPER BEARING

YOUNGSTOWN SHEET AND TUBE
CO., THE

SHEETS, STEEL, GALVANIZED

WEIRTON STEEL CO.

SOLDER (SILVER), BRAZING ALLOYS, AND FLUXES

HANDY & HARMAN

SOLENOIDS AND SOLENOID COILS

ALLEN-BRADLEY CO.
McDONNELL & MILLER, INC.

STOCKS AND DIES

TOLEDO PIPE THREADING MACHINE CO., THE

STOKERS, INDUSTRIAL AND COMMERCIAL

BITUMINOUS COAL INSTITUTE
CANTON STOKER CORP.
WILL-BURT CO., THE

STRAINERS, PIPE LINE

BLACKMER PUMP CO.
ELLIOTT CO.
FISHER GOVERNOR CO.
HENRY VALVE CO.
LESLIE CO.
SARCO CO., INC.
WATTS REGULATOR CO.

STRAINERS, REFRIGERANT, LIQUID LINE

ALCO VALVE CO.
HENRY VALVE CO.

SURFACE, FINNED, COOLING, BRINE

G & O MFG. CO., THE
MARLO COIL CO.
MURRAY MFG. CO., D. J.
TRANE CO., THE
YOUNG RADIATOR CO.

SURFACE, FINNED, COOLING, COLD WATER

BAYLEY BLOWER CO.
G & O MFG. CO., THE
GOVERNAIR CORP.
KENNARD CORP.
MARLO COIL CO.
MURRAY MFG. CO., D. J.
NESBITT, INC., JOHN J.
TRANE CO., THE
YORK CORP.
YOUNG RADIATOR CO.

SURFACE, FINNED, COOLING, DIRECT EXPANSION

BAYLEY BLOWER CO.
G & O MFG. CO., THE
GOVERNAIR CORP.
KENNARD CORP.
MARLO COIL CO.
MURRAY MFG. CO., D. J.
PERFEX CORP.
TRANE CO., THE
YORK CORP.
YOUNG RADIATOR CO.

SURFACE, FINNED, HEATING AND COOLING, PRE-ASSEMBLED, INCLUDING COILS, ELIMINATOR PLATES, SETTLING TANK, AND CASING

CLARAGE FAN CO.
MARLO COIL CO.

SURFACE, FINNED, HEATING, INDIRECT, FERROUS

BAYLEY BLOWER CO.
MURRAY MFG. CO., D. J.
TRANE CO., THE

SURFACE, FINNED, HEATING, INDIRECT, NON-FERROUS

BAYLEY BLOWER CO.
G & O MFG. CO., THE
GOVERNAIR CORP.
KENNARD CORP.
MARLO COIL CO.
MODINE MFG. CO.
NESBITT, INC., JOHN J.
TRANE CO., THE
WEBSTER & CO., WARREN
YORK CORP.
YOUNG RADIATOR CO.

SWITCHES, ELECTRICAL

ALLEN-BRADLEY CO.
McDONNELL & MILLER, INC.

SWITCHES, FLOAT, REFRIGERATION

ALCO VALVE CO.

SWITCHES, FLOW

McDONNELL & MILLER, INC.

SWITCHES, LIQUID LEVEL

ALCO VALVE CO.
MERCOID CORP., THE
McDONNELL & MILLER, INC.

SWITCHES, MERCURY

MERCOID CORP., THE

SWITCHES, PNEUMATIC

POWERS REGULATOR CO., THE

SWITCHES, PRESSURE AND VACUUM

ALLEN-BRADLEY CO.
DETROIT CONTROLS CORP.
MERCOID CORP., THE

SWITCHES, TIME

ALLEN-BRADLEY CO.
PARAGON ELECTRIC CO.

SYSTEMS, COMBUSTION CONTROL

CASH CO., A. W.
CLEVELAND FUEL EQUIPMENT CO.
COMBUSTION CONTROL DIV., ELECTRONICS CORP. OF AMERICA
WEBSTER ENGINEERING CO., THE
WHEELCO INSTRUMENTS DIV., BARBER-COLMAN CO.

SYSTEMS, FIRE EXTINGUISHING, AND HEAT AND SMOKE DETECTORS

ALLEN MFG. CO., W. D.
GRINNELL CO., INC.
HEAT-TIMER CORP.

SYSTEMS, HEATING, HOT WATER

BELL & GOSSETT CO.
SARCOTHERM CONTROLS, INC.
WEBSTER & CO., WARREN

SYSTEMS, HEATING, VACUUM

DUNHAM CO., C. A.
ILLINOIS ENGINEERING CO., DIV. OF AMERICAN AIR FILTER CO., INC.
WEBSTER & CO., WARREN

SYSTEMS, HEATING, VAPOR

ILLINOIS ENGINEERING CO., DIV. OF AMERICAN AIR FILTER CO., INC.
WEBSTER & CO., WARREN

SYSTEMS, HEATING, ZONE CONTROL

BARBER-COLMAN CO.
ILLINOIS ENGINEERING CO., DIV. OF AMERICAN AIR FILTER CO., INC.
IRON FIREMAN MFG. CO.
JOHNSON SERVICE CO.
POWERS REGULATOR CO., THE
WEBSTER & CO., WARREN

SYSTEMS, ROOF SPRAYING (for cooling roofs)

RUPPRIGHT'S ROTARY ROOF COOLER

TANKS, EXPANSION, FOR HOT WATER HEATING SYSTEMS

BELL & GOSSETT CO.

TANKS, PROCESS AND STORAGE

AMERICAN HARD RUBBER CO.

THERMOMETERS, INDICATING, REMOTE-READING

MINNEAPOLIS-HONEYWELL REGULATOR CO.
SARCO CO., INC.

THERMOSTATS, DUCT TYPE

BARBER-COLMAN CO.
CAM-STAT, INC., DIV. OF THE PAUL HENRY CO. (fan and limit controls)
MINNEAPOLIS-HONEYWELL REGULATOR CO.
PERFEX CORP.
POWERS REGULATOR CO., THE

THERMOSTATS, IMMERSION

JOHNSON SERVICE CO.
POWERS REGULATOR CO., THE

THERMOSTATS, ROOM OR WALL

BARBER-COLMAN CO.
JOHNSON SERVICE CO.
MINNEAPOLIS-HONEYWELL REGULATOR CO.
PERFEX CORP.
POWERS REGULATOR CO., THE
SARCOTHERM CONTROLS, INC.

THERMOSTATS, WEATHER COMPENSATING

BARBER-COLMAN CO.
JOHNSON SERVICE CO.
MINNEAPOLIS-HONEYWELL REGULATOR CO.
POWERS REGULATOR CO., THE
SARCOTHERM CONTROLS, INC.
WEBSTER & CO., WARREN

TOOLS

DURO-DYNE CORP. (file handles and solder iron handles)
GREENLEE TOOL CO.
RAMSET DIV., OLIN MATHIESON CHEMICAL CORP., (Powder actuated fasteners)

TORCHES, BRAZING AND SOLDERING

VELOCITY POWER TOOL CO.

TOWERS, COOLING, ATMOSPHERIC

DOVER MFG. CO.
LILIE-HOFFMAN COOLING TOWERS, INC.

TOWERS, COOLING, MECHANICAL DRAFT

ACME INDUSTRIES, INC.
BALTIMORE AIRCOIL CO., INC.
BINKS MFG. CO.
BUSH MFG. CO.
DOVER MFG. CO.
GOVERNAIR CORP.
HALSTEAD & MITCHELL
KENNARD CORP.
LILIE-HOFFMANN COOLING TOWERS, INC.
MARLEY CO., THE
MARLO COIL CO.
NIAGARA PRODUCTS CO.
PEERLESS SALES DIV.
PHILLIPS COOLING TOWERS CO., INC.
PRITCHARD & CO. OF CALIFORNIA, J. F.

TRANSFORMERS, ELECTRIC

WAGNER ELECTRIC CORP.

TRANSMITTERS, PRESSURE AND TEMPERATURE

TAYLOR INSTRUMENT COS.

TRAPS, STEAM, FLOAT-THERMOSTATIC

MARSH HEATING EQUIPMENT CO.
SARCO CO., INC.
STERLING, INC.
WEBSTER & CO., WARREN

TRAPS, STEAM, MECHANICAL

ARMSTRONG MACHINE WKS.
BLACK, SIVALLS & BRYSON, INC.
NICHOLSON & CO., W. H.
SARCO CO., INC.
STERLING ENGRG. & MFG. CORP.
STERLING, INC.
STRONG, CARLISLE & HAMMOND CO.
WEBSTER & CO., WARREN

TRAPS, STEAM, THERMOSTATIC

DUNHAM CO., C. A.
MARSH HEATING EQUIPMENT CO.
NICHOLSON & CO., W. H.
SARCO CO., INC.
STERLING ENGRG. & MFG. CORP.
STERLING, INC.
WEBSTER & CO., WARREN

TREATMENT, FUEL OIL, TO PREVENT SLUDGE

METROPOLITAN REFINING CO., INC.

TREATMENT, STEAM SYSTEM, TO INHIBIT CORROSION

METROPOLITAN REFINING CO., INC.

TREATMENT, WATER, TO INHIBIT CORROSION

METROPOLITAN REFINING CO., INC.

TREATMENT, WATER, TO PREVENT SCALE FORMATION

METROPOLITAN REFINING CO., INC.

TREATMENT, WATER, FOR SLIME AND ALGAE CONTROL

METROPOLITAN REFINING CO., INC.

TUBING, BRASS AND COPPER

BRIDGEPORT BRASS CO.
CHASE BRASS & COPPER CO.
HUSSEY & CO., C. G.
READING TUBE CORP.
REVERE COPPER AND BRASS, INC.
WOLVERINE TUBE, DIV. OF CALUMET & HECLA, INC.

TUBING, FINNED

G & O MFG. CO., THE

TUBING, METAL, FLEXIBLE

UNIVERSAL METAL HOSE CO.

TUBING, STEEL

YOUNGSTOWN SHEET AND TUBE CO., THE

TUBING, STEEL, STAINLESS

PYPON CO., THE

TURBINES, MECHANICAL DRIVE

ELLIOTT CO.
WING MFG. CO., L. J.

UNIONS, PIPE

FAIRBANKS CO., THE
GRABLER MFG. CO.
WATSON-STILMAN FITTINGS DIV., H. K. PORTER CO., INC.

UNITS, AIR CONDITIONING, CENTRAL STATION TYPE

AIR & REFRIGERATION CORP.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
AMERICAN BLOWER CORP.
BISHOP & BABCOCK MFG. CO., THE
CLARAGE FAN CO.
DRAYER-HANSON, INC.
GENERAL ELECTRIC CO.
GOVERNAIR CORP.
KENNARD CORP.
MARLO COIL CO.
NESBITT, INC., JOHN J.
TRANE CO., THE
UNITED STATES AIR CONDITIONING CORP.
VILTER MFG. CO., THE
WORTHINGTON CORP.
YORK CORP.
YOUNG RADIATOR CO.

UNITS, AIR CONDITIONING, HORIZONTAL PACKAGE TYPE

AIR & REFRIGERATION CORP.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
CLARAGE FAN CO.
DRAYER-HANSON, INC.
GOVERNAIR CORP.
KENNARD CORP.
NESBITT, INC., JOHN J.
TRANE CO., THE
VILTER MFG. CO., THE
WESTINGHOUSE ELECTRIC CORP.
YORK CORP.
YOUNG RADIATOR CO.

UNITS, AIR CONDITIONING, INDUSTRIAL TYPE

AIR & REFRIGERATION CORP.
AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
AMERICAN BLOWER CORP.
BISHOP & BABCOCK MFG. CO., THE
CLARAGE FAN CO.
DRAYER-HANSON, INC.
GOVERNAIR CORP.
KENNARD CORP.
KING CO. OF OWATONNA
McQUAY, INC.
NESBITT, INC., JOHN J.
NIAGARA BLOWER CO.
TRANE CO., THE
VILTER MFG. CO., THE
YOUNG RADIATOR CO.

UNITS, AIR CONDITIONING, REVERSE REFRIGERATION CYCLE

ACME INDUSTRIES, INC.

UNITS, AIR CONDITIONING, SUMMER, EVAPORATIVE COOLING TYPE

AIR COOLING ENGINEERING CO.

UNITS, AIR CONDITIONING, SUMMER, ROOM TYPE, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER

MODINE MFG. CO.
TRANE CO., THE
YORK CORP.
YOUNG RADIATOR CO.

UNITS, AIR CONDITIONING, SUMMER, ROOM TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR

AIRTEMP DIV. OF CHRYSLER
YORK CORP.

UNITS, AIR CONDITIONING, SUMMER, STORE TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR

AIRTEMP DIV. OF CHRYSLER
GOVERNAIR CORP.
TRANE CO., THE
YORK CORP.

UNITS, AIR CONDITIONING, WINTER, ROOM TYPE, FLOOR CABINET

MODINE MFG. CO.
TRANE CO., THE
YORK CORP.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET

AMERICAN RADIATOR & STANDARD SANITARY CORP.
DUNHAM CO., C. A.
MARLO COIL CO.
MODINE MFG. CO.
TRANE CO., THE
YORK CORP.

UNITS, FUEL OIL, HEATING, PUMPING AND STRAINING

DAVIS ENGINEERING CORP.
EAGAN CO., INC., WALTER H.
PREFERRED UTILITIES MFG. CORP.

UNITS, HEAT RECOVERY, AIR-TO-AIR

THERM-O-WHEEL, INC.

VALVES AND FITTINGS

CRANE CO. (General)
GRINNELL CO., INC. (General)
NICHOLSON & CO., W. H. (General)
VILTER MFG. CO., THE (General)
WALWORTH CO. (General)

VALVES, BACK PRESSURE

BLACK, SIVALLS & BRYSON, INC.
FISHER GOVERNOR CO.
KLIPFEL VALVES, INC.

VALVES, BALANCING, FOR FORCED HOT WATER HEATING SYSTEMS

BELL & GOSSETT CO.
MAID-O'-MIST, INC.
WEBSTER & CO., WARREN

VALVES, BLOW-OFF

McDONNELL & MILLER, INC.

VALVES, CHECK

HENRY VALVE CO.
JENKINS BROS.
MILLER VALVE CO., INC.
WALWORTH CO.

VALVES, DIAPHRAGM

BLACK, SIVALLS & BRYSON, INC.
GRINNELL CO., INC.
HENRY VALVE CO.
JOHNSON SERVICE CO.
POWERS REGULATOR CO., THE
TAYLOR INSTRUMENT COS.

VALVES, FLOAT

ALCO VALVE CO.
FISHER GOVERNOR CO.
McDONNELL & MILLER, INC.
ROBERT MFG. CO.

VALVES, FLOW CONTROL, FOR HOT WATER HEATING SYSTEMS

BELL & GOSSETT CO.
WEBSTER & CO., WARREN

VALVES, GATE, BRASS AND BRONZE

FAIRBANKS CO., THE
WALWORTH CO.

VALVES, GATE, IRON BODY

JENKINS BROS.

VALVES, GLOBE, BRASS AND BRONZE

WALWORTH CO.

VALVES, MIXING, HOT AND COLD WATER

BELL & GOSSETT CO.
POWERS REGULATOR CO., THE
SARCO CO., INC.
WATTS REGULATOR CO.
YULA WATER HEATERS, INC.

VALVES, MIXING, STEAM AND WATER

POWERS REGULATOR CO., THE
SARCO CO., INC.

VALVES, MOTOR OPERATED

BARBER-COLMAN CO.
HEAT-TIMER CORP.

VALVES, NEEDLE

McDONNELL & MILLER, INC.

VALVES, PLUG

WALWORTH CO.

VALVES, PRESSURE REDUCING AND REGULATING, AIR AND GAS

BLACK, SIVALLS & BRYSON, INC.
CASH CO., A. W.
FISHER GOVERNOR CO.
KECKLEY CO., O. C.
LESLIE CO.
WATTS REGULATOR CO.

VALVES, PRESSURE REDUCING AND REGULATING, HOT WATER

BELL & GOSSETT CO.
BLACK, SIVALLS & BRYSON, INC.
CASH CO., A. W.
FISHER GOVERNOR CO.
KECKLEY CO., O. C.
LESLIE CO.
WATTS REGULATOR CO.
WEBSTER & CO., WARREN

VALVES, PRESSURE REDUCING AND REGULATING, STEAM

CASH CO., A. W.
FISHER GOVERNOR CO.
KECKLEY CO., O. C.
LESLIE CO.
POWERS REGULATOR CO., THE
WATTS REGULATOR CO.

VALVES, RADIATOR, AIR

GORTON HEATING CORP.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL

POWERS REGULATOR CO., THE

VALVES, RADIATOR, ORIFICE

DUNHAM CO., C. A.

VALVES, RADIATOR, STEAM AND HOT WATER

DUNHAM CO., C. A.
MARSH HEATING EQUIPMENT CO.
SARCOTHERM CONTROLS, INC.
WEBSTER & CO., WARREN

VALVES, REFRIGERATION (ANGLE, CHECK, GATE, GLOBE, NEEDLE, RELIEF)

HENRY VALVE CO.

VALVES, REFRIGERATION, BACK PRESSURE

ALCO VALVE CO.

VALVES, REFRIGERATION, EXPANSION, CONSTANT PRESSURE

ALCO VALVE CO.

VALVES, REFRIGERATION, EXPANSION, THERMOSTATIC

ALCO VALVE CO.
SPORLAN VALVE CO.

VALVES, REFRIGERATION, FLOAT

ALCO VALVE CO.

VALVES, RELIEF, HOT WATER

BELL & GOSSETT CO.
McDONNELL & MILLER, INC.
WATTS REGULATOR CO.
WEBSTER & CO., WARREN

VALVES, RELIEF, HYDRAULIC

McDONNELL & MILLER, INC.

VALVES, RELIEF, OIL

McDONNELL & MILLER, INC.

VALVES, SAFETY CLEANOUT

LIQUIDEPTH INDICATORS, INC.

VALVES, SOLENOID

ALCO VALVE CO.
ALLEN-BRADLEY CO.
DETROIT CONTROLS CORP.
GOLDEN ANDERSON VALVE SPECIALITY CO.
McDONNELL & MILLER, INC.
PERFEX CORP.
SPORLAN VALVE CO.

VALVES, 2, 3 AND 4 WAY

OHIO BRASS CO.
JOHNSON SERVICE CO.
POWERS REGULATOR CO., THE
TAYLOR INSTRUMENT COS.

VANES, DUCT TURNING, PREFABRICATED

BARBER-COLMAN CO.
DURO-DYNE CORP.
TITUS MFG. CORP.
WATERLOO REGISTER CO., INC.

VENTILATORS, ROOF, FAN

ALLEN COOLER & VENTILATOR, INC.
AMMERMAN CO., C. L.
BISHOP & BABCOCK MFG. CO., THE
CARNES CORP.
GALLAHER CO., THE
HARTZELL PROPELLER FAN CO.
ILG ELECTRIC VENTILATING CO.
JENN-AIR PRODUCTS CO., INC.
KODY BLOWER CO.
PENN VENTILATOR CO.
SWARTWOUT CO., THE

VENTILATORS, ROOF, GRAVITY

AIR DEVICES, INC.
PENN VENTILATOR CO.
SWARTWOUT CO., THE

VENTILATORS, UNIT

AMERICAN AIR FILTER CO., INC., HERMAN NELSON PRODUCTS
NESBITT, INC., JOHN J.
TRANE CO., THE

VIBRATION CONTROL—SEE ABSORBERS, VIBRATION; BASES AND PADS, VIBRATION ISOLATING; HOSE, FLEXIBLE

WASHERS, AIR

AIR & REFRIGERATION CORP.
BAYLEY BLOWER CO.
CLARAGE FAN CO.
YORK CORP.

WELDERS, ARC

HOBART BROS. CO.

WELDERS, SPOT

DURO-DYNE CORP.
GRAHAM MFG. CORP.

WHEELS, BLOWER

BARRY BLOWER CO.
LAU BLOWER CO., THE
MORRISON PRODUCTS, INC.
UTILITY FAN CORP.

WIRE, ELECTRIC, NUMBERED, FOR CONTROL SYSTEMS

CHESTER CABLE CORP.

WIRE, INSTRUMENT

CHESTER CABLE CORP.

WIRE, OIL BURNER IGNITION

CHESTER CABLE CORP.

WIRING, COMPLETE ASSEMBLIES, CUSTOM-MADE

CORNISH-RUTLAND CO.

WRENCHES, PIPE

TOLEDO PIPE THREADING MACHINE CO.
WALWORTH CO.

For the page on which you will find the advertising of manufacturers in this issue, see the Index to Advertisers on the last two pages of this yellow Directory Section

DIRECTORY SECTION

HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRY AND LARGE BUILDINGS

PART 2—ALL PRODUCTS CLASSIFIED

ABSORBERS, SHOCK, LIQUID, TO ELIMINATE WATER HAMMER IN PIPING

Finn & Co., Inc., T. R., Hawthorne, N. J.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Smith Co., S. Morgan, York, Pa.
Wade Mfg. Co., Elgin, Ill.

ABSORBERS, VIBRATION

See Hose, Metal and Fittings; Bases and Pads, Vibration Isolating

ABSORBERS, VIBRATION, FOR REFRIGERANT LINES

American Metal Hose Branch, The American Brass Co., Waterbury, Conn.
Atlantic Metal Hose Co., Inc., New York, N. Y.
DK Mfg. Co., Cobra Metal Hose Div., Chicago, Ill.
Finn & Co., Hawthorne, N. J.
Flexonics Corp., Maywood, Ill.
Johnson Metal Hose, Inc., Waterbury, Conn.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Pleasantaire Corp., Washington, D. C.
Resistoflex Corp., Belleville, N. J.
Seamlex Co., Inc., Long Island City, N. Y.
Techniflex Corp., Port Jervis, N. Y.
Titeflex, Inc., Newark, N. J.
United Metal Hose Co., Inc., Long Island City, N. Y.
Vibration Mounting, Inc., Elmhurst, N. Y.
Wade Mfg. Co., Elgin, Ill.

ABSORPTION DEHUMIDIFIERS

See Dehumidifiers, Absorption and Adsorption

ABSORPTION REFRIGERATION MACHINES

See Machines, Refrigeration, Absorption

ACCESS DOORS AND PANELS

See Doors and Panels, Access

ACCUMULATORS, REFRIGERATION (FOR AIR CONDITIONING)

Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Dole Refrigerating Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Kenmore Machine Products, Inc., Lyon, N. Y.
McQuay, Inc., Minneapolis, Minn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Phillips & Co., H. A., Chicago, Ill.
Reco Products Div., Recony Corp., New York, N. Y.
Remco, Inc., Zelienople, Pa.
Roessing Mfg. Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Temprite Products Corp., Birmingham, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
Wolverine Tube Div. of Calumet & Helca, Inc., Detroit, Mich.
XL Refrigerating Co., Chicago, Ill.

ADHESIVES, FOR INSULATION OTHER THAN PIPE

Atlas Mineral Products Co., Merztown, Pa.
Durkee-Atwood Co., Minneapolis, Minn.
Flintkote Co., The, New York, N. Y.
Formica Co., Cincinnati, O.
Fuller Co. of Calif., H. B., San Francisco, Calif.
Miracle Adhesives Corp., New York, N. Y.
Moore Inc., Goodloe E. Danville, Ill.
National Pipe Coatings, Inc., Hungtington Park, Calif.
Rubber & Asbestos Corp., Bloomfield, N. J.
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.

ADHESIVES, FOR PIPE COVERING

Arabol Mfg. Co., New York, N. Y.
Armstrong Cork Co., Lancaster, Pa.
Carey Mfg. Co., Philip, Cincinnati, O.
Devices, Inc., New York, N. Y.
Durkee-Atwood Co., Minneapolis, Minn.
Flintkote Co., The, New York, N. Y.
Foster Co., Benjamin, Philadelphia, Pa.
Fuller Co. of Calif., H. B., San Francisco, Calif.
Gates Engineering Co., Wilmington, Del.
Grant Wilson, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., Detroit, Mich.
Miracle Adhesives Corp., New York, N. Y.
Moore Inc., Goodloe E. Danville, Ill.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
National Cork Co., Englewood, N. J.
Pecora Paint Co., Inc., Philadelphia, Pa.
Presstite Engineering Co., St. Louis, Mo.
Rubber & Asbestos Corp., Bloomfield, N. J.
Ruberoid Co., New York, N. Y.
Sauereisen Cements Co., Pittsburgh, Pa.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill.
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.
Swift & Co., Chicago, Ill.
Western Mineral Products Co., Minneapolis, Minn.
Xylos Rubber Co., Akron, O.

ADSORBERS, ODOR

Carbide and Carbon Chemicals Div., Union Carbide & Carbon Corp., New York, N. Y.
Chemurgic Process Corp., New York, N. Y.
Connor Engineering Corp., Danbury, Conn.
Elgin-Refinite, Div. of Elgin Softener Corp., Elgin, Ill.
Manning Co., Charles E., Pittsburgh, Pa.
Pur Air Div., Barnebey-Cheney Co., Columbus, O.
Research Products Corp., Madison, Wis.
Reynolds Electric Co., River Grove, Ill.
S.O.S. Products Co., Inc., Brooklyn, N. Y.
Tamms Industries, Inc., Chicago, Ill.

ADSORPTION DEHUMIDIFIERS

See Dehumidifiers, Absorption and Adsorption

AFTERCOOLERS, COMPRESSED AIR

Adams Co., Inc., R. P., Buffalo, N. Y.
Air Conversion Research Corp., Chicago, Ill.
Alstrom Corp., New York, N. Y.
American Locomotive Co., Alco Products Div., New York, N. Y.
American Moistening Co., Providence, R. I.
Andale Co., Philadelphia, Pa.
Armstrong Co., Richard M., Westchester, Pa.
Brown Fintube Co., The, Elyria, O.
Bury Compressor Co., Erie, Pa.
Centrifix Corp., Cleveland, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Condenser Service & Engineering Co. Inc., Hoboken, N. J.
Davis Engineering Corp.. Elizabeth, N. J.
Downington Iron Works, Downington, Pa.
Doyle and Roth Mfg. Co., Inc., Brooklyn, N. Y.
Electric Sprayit Div., Thomas Industries, Inc., Sheboygan, Wis.
Graham Mfg. Co., Inc., New York, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Howard Iron Works & Alberger Heater Div.. Buffalo, N. Y.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Johnson Corp., The, Three Rivers, Mich.
Joy Mfg. Co., Pittsburgh, Pa.
Kewanee-Ross Corp., Kewanee, Ill.
Manning & Lewis Engineering Co., Newark, N. J.
Modine Mfg. Co., Racine, Wis.
Niagara Blower Co., New York, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Schramm, Inc., West Chester, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Superior Combustion Industries, Inc., New York, N. Y.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., New York, N. Y.

AIR AFTERCOOLERS

See Aftercoolers, Compressed Air

AIR BREAK FITTINGS

See Fittings, Draining, Fixed Air Break

AIR CLEANERS

See Cleaners, Air, Electrical

AIR COMPRESSORS

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AIR CONDITIONERS

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AIR CONDITIONING UNITS

See Units, Air Conditioning

AIR DIFFUSERS

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AIR ELIMINATORS

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AIR FILTER CLEANING COMPOUNDS

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AIR FILTER GAGES

See Gages, Air Filter

AIR FILTERS

See Filters, Air

AIR FRESHENING

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AIR OPERATING VALVES

See Valves, Air Operating

AIR PURIFICATION

See Adsorbers, Odor; Compounds, Air Freshening

AIR RECOVERY EQUIPMENT

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AIR SEPARATORS
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AIR-TANKLESS WATER HEATERS
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AIR VALVES
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AIR VELOCITY METERS
See Meters, Air Velocity, Direct Reading; Anemometers

AIR VENTS
See Eliminators, Air

AIR VOLUME METERS
See Meters, Volume, Air and Gas

AIR WASHERS
See Washers, Air

ALARMS, COMBUSTIBLE GAS
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Johnson-Williams Ltd., Palo Alto, Calif.
Mine Safety Appliances Co., Pittsburgh, Pa.
Taller & Cooper, Inc., Brooklyn, N. Y.

ALARMS, HIGH AND LOW BOILER WATER
American District Telegraph Co., New York, N. Y.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Campbell Co., J. A., Long Beach, Calif.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Coral Designs, Div. of Henry G. Dietz Co., Long Island City, N. Y.
Defender Instrument & Regulator Co., St. Louis, Mo.
Diamond Power Specialty Corp., Lancaster, O.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
Johnson Corp., The, Three Rivers, Mich.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Magnetrol, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Newark Controls Co., Bloomfield, N. J.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reliance Gauge Column Co., Cleveland, O.
Scaico, Inc., Palmyra, N. J.
Schaub Engineering Co., Fred H., Chicago, Ill.
Unit Alarm Co., The, Schenectady, N. Y.
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.

ALARMS, LIQUID LEVEL, AUDIBLE
American District Telegraph Co., New York, N. Y.
Automatic Control Co., St. Paul, Minn.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Boston Auto Gage Co., Pittsfield, Mass.
Bristol Co., The, Waterbury, Conn.
Cooper Co., Clark, Palmyra, N. J.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., St. Louis, Mo.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Magnetrol, Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
Milton Roy Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Newark Controls Co., Bloomfield, N. J.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Reliance Gauge Column Co., Cleveland, O.
Ripley Co., Inc., Middletown, Conn.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scaico, Inc., Palmyra, N. J.
Scully Signal Co., Melrose, Mass.
Uehling Instrument Co., Paterson, N. J.
Unit Alarm Co., The, Schenectady, N. Y.
Wright-Austin Co., Detroit, Mich.

ALARMS, LIQUID LEVEL, VISUAL
Automatic Control Co., St. Paul, Minn.
Bristol Co., The, Waterbury, Conn.
Cooper Co., Clark, Palmyra, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Instruments, Inc., Tulsa, Okla.
Magnetrol, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Scaico, Inc., Palmyra, N. J.
Uehling Instrument Co., Paterson, N. J.

ALARMS, SMOKE
Ace Instrument Co., Inc., Brooklyn, N. Y.
American District Telegraph Co., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cardox Corp., Chicago, Ill.
Cleveland Fuel Equipment Co., Cleveland, Ohio
Combustion Control Div., Electronics Corp. of America, Boston, Mass.
Defender Instrument & Regulator Co., St. Louis, Mo.
De-Tec-Tronic Laboratories, Inc., Chicago, Ill.
Edwards, L. V., Rockville Center, N. Y.
Ess Instrument Co., Bergenfield, N. J.
McNeill Engineering Co., Chicago, Ill.
Ripley Co., Inc., Middletown, Conn.
Standard Instrument Corp., New York, N. Y.
Sterns-Flinn Corp., New York, N. Y.
Unit Alarm Co., The, Schenectady, N. Y.
Worner Electronic Devices, Rankin, Ill.

ALARMS, TEMPERATURE
American District Telegraph Co., New York.
Bristol Co., The, Waterbury, Conn.
Custom Mfg. Co., Chicago, Ill.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.

ALGAE AND SLIME CONTROL, WATER TREATMENT FOR
See Treatment, Water, for Slime and Algae Control

ALUMINUM COATED SHEETS
See Sheets, Aluminum Coated

ALUMINUM PIPE
See Pipe, Aluminum

ALUMINUM SHEETS
See Sheets, Aluminum

ANALYZERS, CARBON DIOXIDE, PORTABLE
Airserco Mfg. Co., Inc., Pittsburgh, Pa. (electrical)
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Cardox Corp., Chicago, Ill.
Daigger & Co., A., Chicago, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Chicago, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Engelhard, Inc., Chas., Newark, N. J.
Hays Corp., Michigan City, Ind.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Permutit Co., New York, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Service to Industry, West Hartford, Conn.
Standard Instrument Corp., New York, N. Y.
Uehling Instrument Co., Paterson, N. J.
Victory Engineering Corp., Union, N. J.
Will Corp., Rochester, N. Y.

ANCHORS FOR INSULATION
See Fasteners, Insulation

ANEMOMETERS
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Beckman & Whitley, Inc., San Carlos, Calif.
Daigger & Co., A., Chicago, Ill.
Dietzgen Co., Eugene, Chicago, Ill.
Flow Corp., Cambridge, Mass. (Hot wire)
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
General Scientific Equipment Co., Philadelphia, Pa.
Hill, E. Vernon & Co., Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Mine Safety Appliances Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Wallace & Tiernan Co., Inc., Newark, N. J.

ANGLE VALVES
See Valves, Angle

ANGLES, BARS, BEAMS, CHANNELS AND TEES (LIGHT WEIGHT SHAPES)
Allegheny Ludlum Steel Corp., Pittsburgh, Pa. (Stainless)
Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
Atlantic Steel Co., Atlanta, Ga.
Bethlehem Steel Co., Bethlehem, Pa.
Byers Co., A. M., Pittsburgh, Pa.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
Decatur Iron & Steel Co., Decatur, Ala.
Dow Chemical Co., The, Midland, Mich.
Harvey Aluminum, Torrance, Calif.
Inland Steel Co., Chicago, Ill.
Inland Steel Products Co., Milwaukee, Wis.
International Steel Co., Evansville, Ind.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Kling Bros. Engineering Wks., Chicago, Ill.
Laclede Steel Co., St. Louis, Mo.
Lees, John, Div., The, Serrick Corp., Muncie, Ind.
Mesker Steel Corp., Geo. L., Evansville, Ind.
Republic Steel Corp., Cleveland, O.
Revere Copper and Brass, Incorporated, New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
Truscon Steel Div., Republic Steel Corp., Youngstown, O.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

ANODES FOR CORROSION PROTECTION
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ANTI-FREEZE COMPOUNDS FOR SNOW MELTING
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AQUASTATS
See Thermostats

ARC WELDERS
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ARC WELDING ELECTRODES
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ASBESTOS FIBER AND CEMENT PIPE
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ASBESTOS MATERIALS
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ASBESTOS PACKING
See Packing, Asbestos

ASH CONVEYORS
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ASSEMBLIES, MANIFOLD, FOR METERS

Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.

ATOMIZING NOZZLES

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AXIAL FLOW FANS

See Fans, Axial Flow, Pressure Type

BACKING RINGS

See Rings, Welding

BALANCING ELBOWS FOR HOT WATER HEATING SYSTEMS

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BALANCING EQUIPMENT

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BALANCING VALVES

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BALL BEARINGS

See Bearings, Ball

BAROMETRIC CONTROLS

See Controls, Draft, Barometric

BASEBOARD RADIATION

See Radiation, Baseboard

BASES, MOTOR, TENSION ADJUSTING

Ackermann Mfg. Co., Wheeling, W. Va.
Alexander Bros., Philadelphia, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Reeves Pully Co., Columbus, Ind.
Rhoads & Sons, J. E., Philadelphia, Pa.
Valley Foundry & Machine Works, Inc., Fresno, Calif.

BASES AND PADS, VIBRATION ISOLATING

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Barry Corp., Watertown, Mass.
Buffalo Forge Co., Buffalo, N. Y.
Celotex Corp., The, Chicago, Ill.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Cork Insulation Co., Inc., New York, N. Y.
Fabreeka Products Co., Inc., Boston, Mass.
Felters Company, The, Boston, Mass.
Firestone Industrial Products, Akron, O.
Glass Fibers, Inc., Toledo, O.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hobsite Products Co., Harrison, N. J.
Johns-Manville, New York, N. Y.
Korfund Co., Inc., Long Island City, N. Y.
Lord Mfg. Co., Erie, Pa.
M B Mfg. Co., Inc., The, New Haven, Conn.
Mundet Cork Corp., North Bergen, N. J.
National Cork Co., Englewood, N. J.
National Lead Co., New York, N. Y.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Raybestos-Manhattan, Inc., Passaic, N. J.
Robinson Aviation, Inc., Teterboro, N. J.
Sponge Rubber Products Co., The, Shelton, Conn.
Spring Packing Corp., Chicago, Ill.
United Cork Companies, Kearny, N. J.
United States Rubber Co., New York, N. Y.
Vibration Eliminator Co., Long Island City, N. Y.
Vibration Mounting, Inc., Elmhurst, L. I., N. Y.
Western Felt Works, Chicago, Ill.

BEARINGS, BALL

Ahlberg Bearing Co., Chicago, Ill.
Bearings Co. of America, Federal Mogul Corp., Lancaster, Pa.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., The, New Britain, Conn.
Landis & Gyr Inc., New York, N. Y.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
New Departure Div., General Motors Corp., Bristol, Conn.
Nice Ball Bearing Co., Philadelphia, Pa.
Norma-Hoffman Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Philadelphia, Pa.
Schatz Mfg. Co., The, Poughkeepsie, N. Y.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Thomson Industries, Inc., Manhasset, N. Y.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, NEEDLE

Roller Bearing Co. of America, West Trenton, N. J.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.

BEARINGS, PILLOW BLOCK

Ahlberg Bearing Co., Chicago, Ill.
Anti-Friction Bearings Co., Los Angeles, Calif.
Bearings Co. of America Div., Federal Mogul Corp., Lancaster, Pa.
Caldwell Co., W. E., Louisville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago, Ill.
Chain Belt Co., Milwaukee, Wis.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clizbe Bros., Mfg. Co., Plymouth, Ind.
Congress Drives Div., Tann Corp., Detroit, Mich.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Fafnir Bearing Co., The, New Britain, Conn.
Freed Products Co., Moline, Ill.
Goldens' Foundry & Machine Co., Columbus, Ga.
Jeffrey Mfg. Co., Columbus, O.
Jones Foundry & Machine Co., W. A., Chicago, Ill.
Lau Blower Co., Dayton, O.
Link-Belt Co., Chicago, Ill.
Medart Co., St. Louis, Mo.
Moraine Products Div., General Motors Corp., Dayton, O.
Randall Graphite Bearings, Inc., Lima, O.
Royersford Foundry & Machine Co., Inc., Royersford, Pa.
SKF Industries, Inc., Philadelphia, Pa.
Shafer Bearing, Div. of Chain Belt Co., Downers Grove, Ill.
Sprout, Waldron & Co., Muncy, Pa.
Standard Pressed Steel Co., Jenkintown, Pa.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Triangle Mfg. Co., Oshkosh, Wis.
Whiteley Bearing Corp., Chicago, Ill.
Wood's Sons Co., T. B., Chambersburg, Pa.

BEARINGS, ROLLER

Chain Belt Co., Milwaukee, Wis.
Dodge Mfg. Corp., Mishawaka, Ind.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Link-Belt Co., Chicago, Ill.
Marlin-Rockwell Corp., Jamestown, N. Y.
Medart Co., St. Louis, Mo.
Norma-Hoffman Bearings Corp., Stamford, Conn.
Roller Bearing Co. of America, West Trenton, N. J.
Royersford Foundry & Machine Co, Inc., Royersford, Pa.
SKF Industries, Inc., Philadelphia, Pa.
Shafer Bearing, Div. of Chain Belt Co., Downers Grove, Ill. (self aligning)
Timken Roller Bearing Co., Canton, O.
Torrington Co., The, Bantam Bearings Div., South Bend, Ind.

BEARINGS, SLEEVE

Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
Bronze Bearings, Inc., Cranford, N. J.
Chemalloy Associates, Santee, Calif.
Cleveland Graphite Bronze Co., Cleveland, O.
Dodge Mfg. Corp., Mishawaka, Ind.
Federal-Mogul Corp., Detroit, Mich.
Gatke Corp., Chicago, Ill.
Green Fuel Economizer Co., Beacon, N. Y.
Haveg Corp., Newark, Del. (plastic)
International Powder Metallurgy, Inc., Ridgway, Pa.
Johnson Bronze Co., New Castle, Pa.
Keystone Carbon Co., Inc., St. Marys, Pa.
Lau Blower Co., Dayton, O.
Link Belt Co., Chicago, Ill.
Medart Co., St. Louis, Mo.
Moraine Products Div., General Motors Corp., Dayton, O.
Morganite, Inc., Carbon Specialties Div., Long Island City, N. Y.
Morrison Products Inc., Cleveland, O.
Randall Graphite Bearings, Inc., Lima, O.
Thomson Industries, Inc., Manhasset, N. Y.
Whiteley Bearing Corp., Chicago, Ill.

BELLOWS, THERMOSTATIC AND METALLIC

Bishop & Babcock Mfg. Co., Cleveland, O.
Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., Bridgeport, Conn.
Bristol Co., The, Waterbury, Conn.
Clifford Mfg. Co., of Standard-Thomson Corp., Waltham, Mass.
Cook Electric Co., Chicago, Ill.
Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Flexonics Corp., Maywood, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Solar Aircraft Co., San Diego, Calif.
Titeflex, Inc., Newark, N. J.
Zallea Bros., Wilmington, Del.

BELTING, FLAT, LEATHER

Alexander Bros., Philadelphia, Pa.
Allen Mfg. Co., W. D. Chicago, Ill.
Baldwin Belting, Inc., New York, N. Y.
Chicago Belting Co., Chicago, Ill.
Graton & Knight Co., Worcester, Mass.
Hewitt-Robins, Inc., Hewitt Rubber Div., Buffalo, N. Y.
Houghton & Co., E. F., Philadelphia, Pa.
Rhoads & Sons, J. E., Philadelphia, Pa.
Schieren Co., Chas. A., New York, N. Y.
Sikes Co., S. R., Minneapolis, Minn.
Williams & Son, I. B., Dover, N. H.

BELTING, FLAT, RUBBER

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dick Co., Inc., R. & J., Passiac, N. J.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins, Inc., Hewitt Rubber Div., Buffalo, N. Y.
Manheim Mfg. & Belting Co., Manheim, Pa.
New York Belting & Packing Co., Passiac, N. J.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Thermoid Co., Trenton, N. J.
United States Rubber Co., New York, N. Y.

BELTS, V

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
America Pulley Co., Philadelphia, Pa.
Baldwin Belting, Inc., New York, N. Y.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Inc., Maysville, Ky.
Chicago Belting Co., Chicago, Ill.
Congress Drives Div., Tann Corp., Detroit, Mich.
Continental Rubber Wks., Erie, Pa.
Dayton Rubber Co., Dayton, O.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Gates Rubber Co., Denver, Colo.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Jones Foundry & Machine Co., W. A., Chicago, Ill.
Manheim Mfg. & Belting Co., Manheim, Pa.
Maurey Mfg. Corp., Chicago, Ill.
Medart Co., St. Louis, Mo.
New York Belting & Packing Co., Passaic, N. J.
Pyott Foundry & Machine Co., Chicago, Ill.
Quaker Rubber Corp., Div., of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Reeves Pully Co., Columbus, Ind.

Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Rhoads & Sons, J. E., Philadelphia, Pa.
Schieren Co., Chas. A., New York, N. Y.
Sikes Co., S. R., Minneapolis, Minn. (leather)
Thermoid Co., Trenton, N. J.
United States Rubber Co., New York, N. Y.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J.

BENDERS, PIPE

American Pipe Bending Machine Co., Inc., Poultney, Vt.
American Pipe Tool Co., Chicago, Ill.
Blackhawk Mfg. Co., Milwaukee, Wis.
Buffalo Forge Co., Buffalo, N. Y.
Capewell Mfg. Co., Hartford, Conn.
Crown Die & Tool Corp., Chicago, Ill. (Hand)
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Holsclaw Bros., Inc., Evansville, Ind.
Hossfeld Mfg. Co., Winona, Minn.
Imperial Brass Mfg. Co., Chicago, Ill.
Knights Co., James, Sandwich, Ill.
National Pipe Bending Co., New Haven, Conn.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Pacific Machine & Iron Wks., Tacoma, Wash.
Pedrick Tool & Machine Co., Philadelphia, Pa.
Pines Engineering Co., Inc., Aurora, Ill.
Radiant Devices, St. Louis, Mo.
Sac Tool Mfg. Co., St. Louis, Mo.
Skinner Co., M. B., South Bend, Ind.
Solon Mfg. Co., Solon, O.
Tal Bender, Inc., Milwaukee, Wis.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vanderman Mfg. Co., Willimantic, Conn.
Wallace Supplies Mfg. Co., Chicago, Ill.

BENDERS, TUBING

Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Wks., Allentown, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Duro Metal Products Co., Chicago, Ill.
Everhot Products Co., Chicago, Ill.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Griffith Equipment Co., Inc., Los Angeles, Calif.
Hill, Inc., Walter P., Detroit, Mich.
Holsclaw Bros., Inc., Evansville, Ind.
Hossfeld Mfg. Co., Winona, Minn.
Imperial Brass Mfg. Co., Chicago, Ill.
Keeney Mfg. Co., Newington, Conn.
National Pipe Bending Co., New Haven, Conn.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Pacific Machine & Iron Wks., Tacoma, Wash.
Parker Appliance Co., The, Cleveland, O.
Pedrick Tool & Machine Co., Philadelphia, Pa.
Pines Engineering Co., Inc., Aurora, Ill.
Republic Steel Corp., Steel and Tubes Div., Cleveland, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Solon Mfg. Co., Solon, O.
Steel City Electric Co., Pittsburgh, Pa.
Tal Bender, Inc., Milwaukee, Wis.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Wallace Supplies Mfg. Co., Chicago, Ill.

BENDS, EXPANSION, STEAM PIPE

Albert Pipe Supply Co., Brooklyn, N. Y.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
Atlantic Pipe Bending & Fabricating Corp., Wood-Ridge, N. J.
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa.
Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Durant Insulated Pipe Co., Palo Alto, Calif.
Flori Pipe Co., The, St Louis, Mo.
Grinnell Co., Inc., Providence, R. I.
Kellogg Co., M. W., The, New York, N. Y. (Corrugated steel)
Lumsden & Van Stone Co., Div. of Midwest Piping Co., Inc., South Boston, Mass.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Parks-Cramer Co., Fitchburg, Mass.
Pittsburgh Pipe Coil & Bending Co., Etna, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Rempe Co., Chicago, Ill.
Ric-wiL Co., The, Barberton, O.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Shaw Co., Benjamin F., Wilmington, Del.
Shaw-Kendall Engineering Co., Toledo, O.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Western Piping & Engineering Co., San Francisco, Calif.
Whitlock Mfg. Co., Hartford, Conn.

BI-METALS, THERMOSTATIC

Baker & Co., Inc., Newark, N. J.
Chace Co., W. M., Detroit, Mich.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Wilson Co., H. A., The, Union, N. J.

BLADES, PROPELLER FAN

Ackermann Mfg. Co., Wheeling, W. Va.
Aerovent Fan Co., Inc., Piqua, O.
Aire-Foile Fan & Blower Co., Detroit, Mich.
Airmaster Corp., Chicago, Ill.
Alliance Mfg. Co., Alliance, O.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Brookside Products Co., Inc., McCordsville, Ind.
Burden Co., Alan E., Los Angeles, Calif.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Dual-Air Fan Co., South Elgin, Ill.
Electrovent Fan & Mfg. Co., Chicago, Ill.
International Engrg. Inc., Dayton, O.
Kody Blower Co., Trenton, N. J.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Martin Fan & Blower Co., Chicago, Ill.
Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Motionair Co., Los Angeles, Calif.
Myers Electric Co., Inc., Pittsburgh, Pa.
Panelyte Div., St. Regis Paper Co., New York, N. Y.
Peerless Electric Co., Warren, O.
Propellair Div., Robbins & Myers Inc., Springfield, O.
Robinson Ventilating Co., Zelionople, Pa.
Roto-Beam, Chicago, Ill.
Schwitzer-Cummins Co., Indianapolis, Ind.
South Bend Air Products, Inc., South Bend, Ind.
Standard Electric Mfg. Co., West Berlin, N. J.
Thermal Industries, Indio, Calif.
Torrington Mfg. Co., Torrington, Conn.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Wind-Way Fan & Ventilator Co., New Orleans, La.

BLAST GATES

See Gates, Blast

BLAST HEATERS

See Surface, Finned, Heating

BLAST HEATING COILS

See Surface, Finned, Heating

BLINDS, LINE, PIPE

Hamer Valves, Inc., Long Beach, Calif.

BLOCKS, TERMINAL, FOR ELECTRICAL CONNECTIONS

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Marathon Electric Mfg. Corp., Wausau, Wis.
Sealed Unit Parts Co., Inc., Bronx, N. Y.

BLOW PIPE FITTINGS

See Fittings, Blow Pipe

BLOWER FANS

See Fans, Axial Flow and Fans, Centrifugal

BLOWER HOUSINGS

See Housings, Fan

BLOWER WHEELS

See Wheels, Blower

BLOWERS, HIGH PRESSURE

For Low Pressure Blower Fans, See Fans, Centrifugal

Aladdin Heating Corp., Oakland, Calif.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Blower Corp., Detroit, Mich.
Bayley Blower Co., Milwaukee, Wis.
Beach-Russ Co., New York, N. Y.
Brookside Products Co., Inc., McCordsville, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Carling Turbine Blower Co., Worcester, Mass.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
De Laval Steam Turbine Co., Trenton, N. J.
Dynamic Air Engineering, Inc., Los Angeles, Calif.
Eastern Air Devices, Inc., Dover, N. H.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electric Sprayit Div., Thomas Industries, Inc., Sheboygan, Wis.
Frigid, Inc., Brooklyn, N. Y.
General Blower Co., Morton Grove, Ill.
Ilg Electric Ventilating Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg., Pittsburgh, Pa.
Lammert & Mann Co., Chicago, Ill.
Lamson Corp., Blower Div., Syracuse, N. Y.
Martin Fan & Blower Co., Chicago, Ill.
North American Mfg. Co., Cleveland, O.
Peerless Electric Co., Warren, O.
Power Engineering Co., Chicago, Ill.
Prat-Daniel Corp., South Norwalk, Conn.
Read Standard Corp., Blower-Stoker Div., York, Pa.
Research Vacuum Supply Co., Chicago, Ill.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Roots-Connersville Blower Corp., Connersville, Ind.
Spencer Turbine Co., Hartford, Conn.
Standard Electric Mfg. Co., West Berlin, N. J.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

BLOWERS, SOOT

Bayer Co., St. Louis, Mo.
Chesterton Co., A. W., Everett, Mass.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Diamond Power Specialty Corp., Lancaster, O.
General Blower Co., Inc., Philadelphia, Pa.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Marion Machine Foundry & Supply Co., Marion, Ind.
Perfection Grate & Stoker Co., Springfield, Mass.

BLOW-OFF VALVES

See Valves, Blow-off

BLUE PRINT MACHINES

See Machines, Blue Print and White Print

BOARDS, PANEL AND CONTROL

Ace Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.

Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Falstrom Co., Passaic, N. J.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hays Corp., Michigan City, Ind.
Iron Fireman Mfg. Co., Cleveland, O.
Johns-Manville, New York, N. Y.
Littleford Bros., Inc., Cincinnati, O.
Marsh Instrument Co., Skokie, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Norristown Magnesia & Asb. Co., Norristown, Pa.
Square D Co., Detroit, Mich.
Taller & Cooper, Inc., Brooklyn, N. Y.
Trerice Co., H. O., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.

BOILER CLEANING COMPOUNDS

See Compounds, Boiler Cleaning

BOILER FEED PUMPS

See Pumps, Boiler Feed

BOILER FEEDERS

See Feeders, Water, Heating Boiler

BOILER GAGES

See Gages, Liquid Level

BOILER OBSERVATION PORTS

See Ports, Observation, Boiler

BOILER SEALING COMPOUNDS

See Compounds, Boiler and Radiator Sealing

BOILER AND TANK INSULATION

See Insulation, Boiler and Tank

BOILER TUBES

See Tubes, Boiler

BOILER WATER ALARMS

See Alarms, High and Low Boiler Water

BOILERS, ELECTRIC

See Generators, Steam, Electric

BOILERS, HEATING, CAST IRON, SECTIONAL

2000 *Sq Ft Steam Radiation and Over*

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Burnham Corp., Irvington, N. Y.
Crane Co., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Mueller Climatrol, Milwaukee, Wis.
National Radiator Co., The, Johnstown, Pa.
Norge Heat Div., Borg-Warner Corp., Kalamazoo, Mich.
Peerless Heater Co., The, Div. of the Eastern Foundry Co., Boyertown, Pa. (gas fired)
Pennsylvania Furnace & Iron Co., Warren, Pa.
Prox Co., Inc., Frank, Terre Haute, Ind.
Richmond Radiator Co., Metuchen, N. J.
Smith Co., Inc., H. B., The, Westfield, Mass.
Surface Combustion Corp., Toledo, O.
United States Radiator Corp., Detroit, Mich.
Weil-McLain Co., Michigan City, Ind.

BOILERS, HEATING, STEEL, FIRE TUBE

2000 *Sq Ft Steam Radiation and Over*

Aldrich Co., Wyoming, Ill.
Ames Iron Works, Inc., Oswego, N. Y.
Atlantic Steel Boiler Co., Philadelphia, Pa.
Bigelow Co., New Haven, Conn.
Birchfield Boiler, Inc., Tacoma, Wash.
Boiler Engineering & Supply Co., Inc., Phoenixville, Pa.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Burnham Corp., Irvington, N. Y.
Combustion Engineering, Inc., New York, N. Y.
Consolidated Boiler Corp., Boston, Mass.
Crotty Mfg. Corp., Flushing, L. I., N. Y.
Dewey-Shepard Boiler Co., Indianapolis, Ind.
Dillon Steam Boiler Wks., Inc., D. M., Fitchburg, Mass.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Edge Moor Iron Works, Inc., Edge Moor, Del.
Erie City Iron Wks., Erie, Pa.
Farrar & Trefts, Buffalo, N. Y.
Fitzgibbons Boiler Co., Inc., New York, N. Y.
Hamburg Boiler Works, Inc., Hamburg, Pa.
Hodge Boiler Wks., East Boston, Mass.
International Engineering Wks., Inc., Framingham, Mass.
Johnston Bros., Inc., Ferrysburg, Mich.
Kewanee-Ross Corp., Kewanee, Ill.
Leffel & Co., James, Springfield, O.
Lookout Boiler & Mfg. Co., Chattanooga, Tenn.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
Mund Boilers, Inc., Los Angeles, Calif.
Murray Iron Wks. Co., Burlington, Ia.
National Radiator Co., The, Johnstown, Pa.
Norse Boiler Co., Inc., New Market, N. J.
Orr & Sembower, Inc., Reading, Pa.
Pacific Steel Boiler Div., United States Radiator Corp., Detroit, Mich. (400 sq ft thru 56830 sq ft)
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Republic Boiler Corp., New York, N. Y.
Smith Twin Tubular Boiler Co., Inc., Philadelphia, Pa.
Spencer Heater, Lycoming Division, Avco Mfg. Corp., Williamsport, Pa.
Stout & Sons, David, St. Louis, Mo.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Titusville Iron Wks. Co., The, Titusville, Pa.
Wickes Boiler Co., Saginaw, Mich.

BOILERS, HEATING, STEEL, WATER TUBE

Ajax Boiler & Heater Co., Gardena, Calif.
Anetsberger Bros., Inc., Northbrook, Ill.
Babcock & Wilcox Co., New York, N. Y.
Bigelow Co., The, New Haven, Conn.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Bryan Steam Corp., Peru, Ind.
Central States Steel Boiler Co., Chicago, Ill.
Columbia Boiler Co., Pottstown, Pa.
Combustion Engineering, Inc., New York, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crotty Mfg. Corp., Flushing, L. I., N. Y.
Edge Moor Iron Wks., Inc., Edge Moor, Del.
Erie City Iron Wks., Erie, Pa.
International Boiler Wks. Co., The, East Stroudsburg, Pa.
Keeler Co., E., Williamsport, Pa.
Koven & Bro., L. O., Inc., Jersey City, N. J.
Morheat Corp., Lansing, Mich.
Mund Boilers, Inc., Los Angeles, Calif.
Murray Iron Wks., Co., Burlington, Ia.
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif.
Riley Stoker Corp., Worcester, Mass.
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
Springfield Boiler Co., Springfield, Ill.
Titusville Iron Works Co., The, Titusville, Pa.
V. & E. Products, Inc., Schuylkill Haven, Pa.
Viking Mfg. Corp., Cleveland, O.
Vogt Machine Co., Henry, Louisville, Ky.
Waterfilm Boilers, Inc., Jersey City, N. J.
Wickes Boiler Co., Saginaw, Mich.
Zingheim Co., William C., Chicago, Ill.

BOILERS, PACKAGED UNITS, HEATING AND PROCESS—*Including Controls, Feed Pump, etc.*

Ames Iron Works, Inc., Oswego, N. Y.
Babcock & Wilcox Co., New York, N. Y.
Bigelow Co., The, New Haven, Conn.
Boiler Engineering & Supply Co., Phoenixville, Pa.
Bros Boiler & Mfg. Co., Wm., Minneapolis.
Brown Fintube Co., The, Elyria, O.
Clayton Mfg. Co., El Monte, Calif.
Cleaver-Brooks Co., Milwaukee, Wis.
Columbia Boiler Co., Pottstown, Pa.
Combustion Engineering, Inc., New York, N. Y. (4,000 lb/Hr to 40,000 lb/Hr)
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Consolidated Boiler Corp., Boston, Mass.
Cyclotherm Div., United States Radiator Corp., Oswego, N. Y.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Edge Moor Iron Works, Inc., Edge Moor, Del.
Erie City Iron Works, Erie, Pa.
Farrar & Trefts, Buffalo, N. Y.
Foster Wheeler Corp., New York, N. Y.
Hoffberger Co., C., Baltimore, Md. (12 to 600 hp, oil fuel, 15 to 150 psi)
Hydrotherm, Inc., Northvale, N. J. (Gas Fired only. 45,000 to 500,000 Btu input; 100 psi ASME)
International Boiler Works Co., East Stroudsburgh, Pa.
Iron Fireman Mfg. Co., Cleveland, O.
Johnston Bros., Inc., Ferrysburg, Mich.
Keeler Co., E., Williamsport, Pa.
Kewanee-Ross Corp., Kewanee, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Leffel & Co., James, Springfield, O.
Littleford Bros., Inc., Cincinnati, O.
Manville Boiler Co., Inc., Hackettstown, N. J.
Martin Co., Inc., J. O., San Francisco, Calif.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Mund Boilers, Inc., Los Angeles, Calif.
Murry Iron Works Co., Burlington, Ia.
Norse Boiler Co., Inc., New Market, N. J.
Orr & Sembower, Inc., Reading, Pa.
Pacific Steel Boiler Div., U. S. Radiator Corp., Detroit, Mich. (510 sq ft oil or gas)
Parker Boiler Mfg. Co., Sid E., Los Angeles, Calif. (1½ Hp - 125 Hp. Pressure to 200 psi)
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa. (oil: 440-1440 edr; 0-30 psi oil; and gas)
Petro, Cleveland, O.
Preferred Utilities Mfg. Corp., New York. (20 to 600 boiler hp. Design pressure from 15 to 250 psi. All grades of oil and gas or combination gas and oil)
Ray Oil Burner Co., San Francisco, Calif.
Rite Engineering & Mfg. Corp., Los Angeles.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O. (114,000 to 1,000,000 Btu gas or oil)
Sellers Engineering Co., Chicago, Ill.
Springfield Boiler Co., Springfield, Ill. (6,000 to 39,000 lb per hr, 200 to 900 psig, gas & oil fired)
Superior Combustion Industries, Inc., New York, N. Y.
Texsteam Corp., Houston, Tex.
Titusville Iron Works Co., The, Titusville, Pa.
Union Iron Works, Erie, Pa.
Vapor Heating Corp., Chicago, Ill.
Waterfilm Boilers, Inc., Jersey City, N. J.
Wickes Boiler Co., Saginaw, Mich.
York-Shipley, Inc., York, Pa.

BOLTS, EXPANSION

Arro Expansion Bolt Co., Marion, O.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago, Ill.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Industrial Screw Co., Chicago, Ill.
Kenney Co., L. C., Chicago, Ill.
Line Material Co., Milwaukee, Wis.
Mastercraft Plastics Co., Inc., Jamaica, N. Y.
National Lead Co., New York, N. Y.
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind.
Polis Mfg. Co., J. D., Chicago, Ill.
Rawlplug Co., Inc., The, New York, N. Y.
Star Expansion Bolt Co., New York, N. Y.
Star Stainless Screw Co., Paterson, N. J.
U. S. Expansion Bolt Co., York, Pa.

BOLTS AND STUDS, FLANGE

Bethlehem Steel Co., Bethlehem, Pa.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Clark Bros. Bolt Co., Milldale, Conn.
Continental Screw Co., New Bedford, Mass.
Crane Co., Chicago, Ill.
Erie Bolt & Nut Co., Erie, Pa.
Harper Co., H. M., Morton Grove, Ill.
Haskell Mfg. Co., Wm. H., Pawtucket, R. I.
Industrial Screw Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.

Polis Mfg. Co., J. D., Chicago, Ill.
Republic Steel Corp., Bolt & Nut Div., Cleveland, O.
Rockford Screw Products Co., Rockford, Ill.
Russell, Purdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Star Stainless Screw Co., Paterson, N. J.
Victor Products Corp., Chicago, Ill.

BOLTS, TOGGLE AND ANCHOR

Arro Expansion Bolt Co., Marion, O.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Expansion Bolt Co., Chicago, Ill.
Crawford Co., Chicago, Ill.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Industrial Screw Co., Chicago, Ill.
Line Material Co., Milwaukee, Wis.
Moore, Inc., Goodloe E., Danville, Ill.
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind.
Polis Mfg. Co., J. D., Chicago, Ill.
Rawlplug Co., Inc., The, New York, N. Y.
Republic Steel Corp., Cleveland, O.
Star Expansion Bolt Co., New York, N. Y.
Star Stainless Screw Co., Paterson, N. J.
U. S. Expansion Bolt Co., York, Pa.

BOOSTERS, GAS

Beach-Russ Co., New York, N. Y.
Bury Compressor Co., Erie, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Leiman Bros., Inc., Newark, N. J.
North American Mfg. Co., Cleveland, O.
Research Vacuum Supply Co., Chicago, Ill.
Roots-Connersville Blower Div., Connersville, Ind.

BOOTHS, PAINTING, SPRAY

Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., The, Harrison, N. J.
Burdett Mfg. Co., Chicago, Ill.
Carolina Blower Co., Inc., Greensboro, N. C.
Centri-Spray Corp., Livonia, Mich. (wet type)
DeVilbiss Co., The, Toledo, O.
Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.
Kirk & Blum Mfg. Co., Cincinnati, O.
Lumm Co., A. H., Toledo, O.
Mahon Co., R. C., The, Detroit, Mich.
M & E Mfg. Co., Indianapolis, Ind.
Newcomb-Detroit Co., Detroit, Mich.
Peters-Dalton, Inc., Detroit, Mich.
Plummer Spray Equipment Co., Napolean, O.
Schmieg Industries, Detroit, Mich.
Spray Engineering Co., Somerville, Mass.
Young & Bertke Co., Cincinnati, O.

BRAKES, SHEET METAL, HAND

Barth Engineering & Mfg. Co., Milldale, Conn.
Dreis & Krump Mfg. Co., Chicago, Ill.
Eiker Mfg. Co., Ogallala, Neb.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Niagara Machine & Tool Works, Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
St. Louis Tool Co., St. Louis, Mo.
Webb Machine & Tool Co., Imperial, Pa.
Whitney Metal Tool Co., Rockford, Ill.

BRAKES, SHEET METAL, PORTABLE

Barth Engineering & Mfg. Co., Milldale, Conn.
Dreis & Krump Mfg. Co., Chicago, Ill.
Eiker Mfg. Co., Ogallala, Neb.
Harris, A. R., Hammond, Ind.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Webb Machine & Tool Co., Imperial, Pa.
Whitney Metal Tool Co., Rockford, Ill.

BRAKES, SHEET METAL, POWER

Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bath Co., Cyril, The Solon, O.
Cincinnati Shaper Co., Cincinnati, O.
Cleveland Crane & Eng. Co., Wickliffe, O.
Diamond Machine Tool Co., Pico, Calif.
Dreis & Krump Mfg. Co., Chicago, Ill.
Heartley Machine & Tool Co., Toledo, O.
Munton Mfg. Co., Franklin Park, Ill.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn.
Verson Allsteel Press Co., Chicago, Ill.
Verson Mfg. Co., The, Dallas, Tex.
Whitney Metal Tool Co., Rockford, Ill.

BRASS PIPE

See Pipe, Brass and Copper

BRASS TUBING

See Tubing, Brass and Copper

BRASS UNIONS

See Unions, Brass

BRASS VALVES

See Valves, Gate; and Valves, Globe

BRAZING TORCHES

See Torches, Brazing

BREAKERS, VACUUM (For Steam Using Equipment)

Associated Valve & Engineering Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Simplex Valve & Meter Co., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Marine & Industrial Products Co., Philadelphia, Pa.
McAlear Mfg. Co., Chicago, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Perfecting Service Co., Charlotte, N. C.
Schade Valve Mfg. Co., Philadelphia, Pa.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Co., Indianapolis, Ind.
Webster & Co., Warren, Camden, N. J.

BRONZE VALVES

See Valves, Gate; and Valves, Globe

BUILDING INSULATION

See Insulation, Building

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL

Adams Mfg. Co., Cleveland, O.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Aston Products, Inc., Hazel Park, Mich.
Automatic Firing Corp., St. Louis, Mo.
Barber Gas Burner Co., Cleveland, O.
Barton Co., Minneapolis, Minn.
Beck Engineering Combustion Kompany, St. Louis, Mo.
Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Burdett Mfg. Co., Chicago, Ill.
Certified Furnace Co., Div. Stainless & Steel Products Co., St. Paul, Minn.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Coppus Engineering Corp., Worcester, Mass.
Dalzen Mfg. Co., St. Clair, Mich.
Dewey-Shepard Boiler Co., Indianapolis, Ind.
Eclipse Fuel Engrg. Co., Rockford, Ill.
Engineer Co., New York, N. Y.
Faber Engineering Co., Inc., Philadelphia, Pa.
Forney Engineering Co., Dallas, Tex.
Fuelguard Co., Dallas, Tex.
Gordon & Piatt, P. O. Box 331, Winfield, Kan.
Haney Gas Burner & Engineers, Monrovia, Calif.
Hauck Mfg. Co., Brooklyn, N. Y.
Iron Fireman Mfg. Co., Cleveland, O.
Jackson & Church Co., Saginaw, Mich.
Jamieson Mfg. Co., Dallas, Tex.
Jerry Finn Engineers, St. Paul, Minn.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Kemp Mfg. Co., C. M., Baltimore, Md.
Kindl-Aire Corp., Cleveland, O.
Laharco Industries, Minneapolis, Minn.
Leahy Mfg. Co., Los Angeles, Calif.
Lientz Co., B. P., Kansas City, Mo.
Mahr Mfg. Co., Div., of Diamond Iron Wks., Inc., Minneapolis, Minn.
Martin Co., Inc., J. O., San Francisco, Calif.
Mettler Co., Inc., The, Los Angeles, Calif.
Mid-Continent Metal Products Co., Chicago, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Newcomb-Detroit Co., Detroit, Mich.
Norman Products Co., Inc., Columbus, O.
North American Mfg. Co., Cleveland, O.
Orr & Sembower, Inc., Reading, Pa.
Peabody Engrg. Corp., New York, N. Y.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Petro, Cleveland, O.
Quiet-Heet Mfg. Corp., Newark, N. J.
Ray Oil Burner Co., San Francisco, Calif.
Rayfield, C. L., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Rockwell Co., W. S., Fairfield, Conn.
Selas Corp. of America, Philadelphia, Pa.
Sellers Engineering Co., Chicago, Ill.
Siemon Mfg. Co., Kansas City, Mo.
Sonner Burner Co., Winfield, Kan.
Standard Fuel & Engineering Co., Detroit, Mich.
Staples & Pfeiffer, San Francisco, Calif.
Stout & Sons, David, St. Louis, Mo.
Sullivan Valve & Engineering Co., Butte, Mont.
Superior Combustion Industries, Inc., New York, N. Y.
Surface Combustion Corp., Toledo, O.
Synchronous Flame, Inc., Walworth, Wis.
Thermapanels, Inc., Santa Clara, Calif.
Timken Silent Automatic Div., Rockwell Spring & Axle Co., Jackson, Mich.
Todd Shipyards Corp., Combustion Equipment Div., Elmhurst, N. Y.
Vacuum Gas Burner, Olean, N. Y.
Vapofier Corp., Chicago, Ill.
Webster Engineering Co., Tulsa, Okla.
Williams Div., Eureka Williams Co., Div. of Henney Motor Co. Inc., Bloomington, Ill.
Zink Co., John, Tulsa, Okla.
Zurn Mfg. Co., J. A., Industrial Div., Erie, Pa.

BURNERS, GAS, COMMERCIAL AND INDUSTRIAL, COMBINED WITH STOKER OR OVER COAL GRATES

Forney Engineering Co., Dallas, Tex.
Iron Fireman Mfg. Co., Cleveland, O.
Lientz Co., B. P., Kansas City, Mo.
Mettler Co., Inc., The, Los Angeles, Calif.
Norman Products Co., Columbus, O.
Radiant Combustion System, Inc., New York, N. Y.
Webster Engineering Co., Tulsa, Okla.

BURNERS, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL

Ace Engineering Co., Chicago, Ill.
Automatic Firing Corp., St. Louis, Mo.
Babcock & Wilcox Co., New York, N. Y.
Beck Engineering Combustion Kompany, St. Louis, Mo.
Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Coppus Engineering Corp., Worcester, Mass.
Eclipse Fuel Engineering Co., Rockford, Ill.
Engineer Co., New York, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., San Francisco, Calif.
Faber Engineering Co., Inc., Philadelphia, Pa.
Forney Engineering Co., Dallas, Tex.
Haney Gas Burner & Engineers, Monrovia, Calif.
Hauck Mfg. Co., Brooklyn, N. Y.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Co., S. T., Bridgeport, Pa. (high pressure atomizing)
Lammert & Mann Co., Chicago, Ill.
Leahy Mfg. Co., Los Angeles, Calif.
Lientz Co., B. P., Kansas City, Mo.
Mahr Mfg. Co., Div. of Diamond Iron Wks., Inc., Minneapolis, Minn.
Mettler Co., Inc., The, Los Angeles, Calif.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Norman Products Co., Inc., Columbus, O.
North American Mfg. Co., Cleveland, O.
Orr & Sambower, Inc., Reading, Pa.

Peabody Engineering Corp., New York, N. Y.
Petro, Cleveland, O.
Preferred Utilities Mfg. Corp., New York.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Ray Oil Burner Co., San Francisco, Calif.
Rayfield-Staffco Burner Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Siemon Mfg. Co., Kansas City, Mo.
Simplex Oil Heating Corp., Philadelphia, Pa.
Sonner Burner Co., Winfield, Kan.
Staples & Pfeiffer, San Francisco, Calif.
Stout & Sons, David, St. Louis, Mo.
Superior Combustion Industries, Inc., New York, N. Y.
Surface Combustion Corp., Toledo, O.
Synchronous Flame, Inc., Walworth, Wis.
Todd Shipyards Corp., Combustion Equipment Div., Elmhurst, N. Y.
Webster Engineering Co., Tulsa, Okla.
York-Shipley, Inc., York, Pa.
Zink Co., John, Tulsa, Okla.

BURNERS, OIL, COMMERCIAL AND INDUSTRIAL

Ace Engineering Co., Chicago, Ill. (Rotary)
Airtemp, Div. of Chrysler Corp., Dayton, O.
Aldrich Co., Wyoming, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Automatic Burner Corp., Chicago, Ill. (high pressure)
Automatic Firing Corp., St. Louis, Mo.
Babcock & Wilcox Co., New York, N. Y.
Beckett Corp., R. W., Elyria, O.
Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Carlin Co., The, Wethersfield, Conn.
Century Engrg. Corp., Cedar Rapids, Ia. (high pressure atomizing)
Certified Furnace Co., Div. Stainless & Steel Products Co., St. Paul, Minn.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Cleaver-Brooks Co., Milwaukee, Wis.
Coen Co., San Francisco, Calif.
Columbia Boiler Co., Pottstown, Pa.
Conco Engineering Works, Div. of H. D. Conkey & Co., Mendota, Ill.
Dalmo-Victor Co., San Carlos, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Delta Heating Corp., Trenton, N. J. (high pressure)
Dewey-Shepard Boiler Co., Indianapolis, Ind. (high pressure & low pressure)
Diesel Oil Burner Corp. of New York, Jamaica, Long Island, N. Y.
Drying Systems, Inc., Chicago, Ill.
Eckhart Mfg. Co., Inc., Union, N. J. (High pressure atomizing)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eds-Wil Burner Corp., Chicago, Ill.
Electrol Burner Mfg. Co., Inc., Rutherford, N. J. (high pressure atomizing)
Engineering Co., New York, N. Y.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., San Francisco, Calif.
Faber Engineering Co., Inc., Philadelphia, Pa.
Fano-Flame Oil Burner Corp., Huntington Park, Calif.
Federal Oil Burner Co., Inc., Philadelphia, Pa. (rotary)
Forney Engineering Co., Dallas, Tex. (both steam atomizing & mechanical, high pressure)
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gold Star Oil Burner Mfg. Co., Inc., Yonkers, N. Y.
Haney Gas Burner & Engineers, Monrovia, Calif. (steam atomizing)
Hardinge Oil Burner & Mfg. Co., Chicago, Ill.
Hauck Mfg. Co., Brooklyn, N. Y. (low pressure air and high pressure steam)
Iron Fireman Mfg. Co., Cleveland, O. (Rotary atomizing, high pressure atomizing)
Jackson & Church Co., Saginaw, Mich.
Johnson Co., S. T., Bridgeport, Pa. (Horizontal rotary)
Kol-Master Corp., Oregon, Ill. (high pressure)
Lammert & Mann Co., Chicago, Ill. (low pressure air or steam atomization)
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y. (horizontal rotary-belt & direct)
Leahy Mfg. Co., Los Angeles, Calif.
Leiman Bros., Inc., Newark, N. J. (low pressure)
Lieblich Oil Burner Inc., New York, N. Y.
Lientz Co., B. P., Kansas City, Mo. (steam atomizing)
Mahr Mfg. Co., Div. of Diamond Iron Wks., Inc., Minneapolis, Minn.
Malleable Iron Fittings Co., Branford, Conn.
Mettler Co., Inc., The, Los Angeles, Calif. (high pressure atomizing and steam atomizing)
Montag Stove & Furnace Works, Portland, Ore.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
National Oil Burner Co. of N. Y. Inc., Brooklyn, N. Y. (Horizontal rotary)
Norge Heat Div., Borg-Warner Corp., Kalamazoo, Mich.
North American Mfg. Co., Cleveland, O.
Nu-Way Corp., The, Rock Island, Ill.
Orr & Sembower, Inc., Reading, Pa. (air-atomizing)
Peabody Engrg. Corp., New York, N. Y.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Petro, Cleveland, O.
Preferred Utilities Mfg. Corp., New York, N. Y. Rotary types; from 7½ gph to 175 gph.
Quiet Automatic Oil Burner Corp., Newark, N. J. (high pressure atomizing)
Quiet-Heet Mfg. Corp., Newark, N. J.
Radiant Combustion System, Inc., New York, N. Y.
Radiant Utilities Corp., Brooklyn, N. Y. (high pressure)
Ray Oil Burner Co., San Francisco, Calif. (High pressure atomizing rotary)
Rayfield Co., C. L., Chicago, Ill. (Low pressure atomizing and Horizontal Rotary)
Rayfield-Staffco Burner Co., Chicago, Ill.
Reif-Rexoil, Inc., Buffalo, N. Y.
Riley Stoker Corp., Worcester, Mass.
Rockwell Co., W. S., Fairfield, Conn.
Schurs Oil Burner Co., Los Angeles, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Siemon Mfg. Co., Kansas City, Mo.
Silent Glow Oil Burner Co., Hartford, Conn.
Simplex Oil Heating Corp., Philadelphia, Pa. (Low and high pressure atomizing, and horizontal rotary types)
Staples & Pfeiffer, San Francisco, Calif. (High pressure and steam atomizing, variable capacity)
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Sun-Ray Burner Mfg. Corp., Jamaica, N. Y.
Superior Combustion Industries, Inc., New York, N. Y. (rotary)
Synchronous Flame, Inc., Walworth, Wis. (High pressure atomizing)
Timken Silent Automatic Div., Rockwell Spring & Axle Co., Jackson, Mich.
Todd Shipyards Corp., Combustion Equipment Div., Elmhurst, N. Y. (Variable capacity, rotary, pressure atomizing, steam atomizing)
United States Radiator Corp., Detroit, Mich.
Utah Hydro Corp., Salt Lake City, Utah
Vapofier Corp., Chicago, Ill. (Pre-mixed gaseous fuel generator)
Way-Wolff Assoc., Inc., New York, N. Y. (marine, high pressure atomizing)
Weatherall Engineers, Inc., Providence, R. I.
Webster Engineering Co., Tulsa, Okla.
Will-Burt Co., The, Orrville, O. (High pressure)
Williams Div., Eureka Williams Co., Div. of Henney Motor Co., Inc., Bloomington, Ill.
York-Shipley, Inc., York, Pa. (Rotary, high pressure atomizing)
Zink Co., John, Tulsa, Okla.

BURNERS, PULVERIZED COAL, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.
Whiting Corp., Harvey, Ill.

BURNERS, PULVERIZED COAL AND GAS, COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., New York., N. Y.
Foster Wheeler Corp., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

BURNERS, PULVERIZED COAL, GAS AND OIL COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.

BURNERS, PULVERIZED COAL AND OIL, COMBINED, COMMERCIAL AND INDUSTRIAL

Babcock & Wilcox Co., New York, N. Y.
Blokolgas System, Inc., Detroit, Mich.
Engineer Co., New York, N. Y.
Foster Wheeler Corp., New York, N. Y.
Peabody Engineering Corp., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.

CABINETS FOR AIR CONDITIONERS, BOILERS, ETC.

See Parts For Heating and Air Conditioning Equipment

CABLE, ELECTRIC HEATING

Chester Cable Corp., Chester, N. Y.
Electromode Corp., Rochester, N. Y.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Roberson Co., L. N., Seattle, Wash.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wrap-On Co., Chicago, Ill.

CABLE, THERMOSTAT

Chester Cable Corp., Chester, N. Y.
Roberson Co., L. N., Seattle, Wash.
United States Rubber Co., New York, N. Y.
Wiegand Co., Edwin L., Pittsburgh, Pa.

CALCULATORS, AIR CONDITIONING, HEATING, VENTILATING, AND PIPING; SLIDE RULE

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Calculator Specialties Co., Chicago, Ill.
Climatemaker Heat Loss Calculator Co., Bloomington, Ill.
Graphic Calculator Co., Chicago., Ill.
Morton Engineering Service, Paul S., Lawrence, Mich. (Btu calculator, area and volume calculator and temperature difference convertor calculator. Area and crackage calculator Btuh calculator)

CAPACITORS, ELECTRICAL, FOR POWER FACTOR CORRECTION

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Capacitor Dept., Hudson Falls, N. Y.
Line Material Co., Milwaukee, Wis.
Westinghouse Electric Corp., Pittsburgh, Pa.

CAPILLARY TUBING

See Tubing, Capillary

CAPS, VENT FLUE

Accurate Sheet Metal Mfg. Works, Chicago, Ill.
Adams Co., The, Dubuque, Iowa
Airjet Ventilator Co., El Monte, Calif.
Ammerman Co., C. L., Minneapolis, Minn.
Boston Machine Works Co., Lynn, Mass.
Breidert Co., G. C., San Fernando, Calif.
Excelsior Steel Furnace Co., The, Chicago, Ill.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (acid proof)
Oil Equipment Mfg. Corp., New Haven, Conn.
Penn Ventilator Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Wallace Co., William, Metalbestos Div., Belmont, Calif.
Waverly Heating Supply Co., Boston, Mass.

CARBON DIOXIDE ANALYZERS

See Analyzers, Carbon Dioxide, Portable

CARBON DIOXIDE INDICATORS

See Indicators, Carbon Dioxide, Boiler Room

CARBON PIPE, TUBING, FITTINGS AND VALVES

See Pipe, Tubing, Fittings and Valves, Carbon and Graphite

CAST IRON PIPE

See Pipe, Cast Iron

CEMENT AND COMPOUNDS, PIPE JOINT

Acorn Refining Co., Cleveland, O.
Akron Metallic Gasket Co., Akron, O.
Arco Co., The, Cleveland, O.
Armite Laboratories, Los Angeles, Calif.
Atlas Chemical Co., Marietta, O.
Babbitt Chemical Specialties Co., New Bedford, Mass.
Baer Bros., New York, N. Y.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Black Magic Products Co., Tulsa, Okla.
Black & White Chemical Co., New York, N. Y.
Blue Ridge Talc Co., Inc., Henry, Va.
Blue Seal Chemical Co., Roselle Park, N. J.
Bowser, Inc., Fort Wayne, Ind.
Cabot, Inc., Samuel, Boston, Mass.
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chicago Gasket Co., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Continental Products Co., Euclid, O.
Crane Co., Chicago, Ill.
Crane Packing Co., Chicago, Ill.
Croll & Son, Jesse G., Philadelphia, Pa.
Diamond Chemical Products, New York, N. Y.
Dixon Crucible Co., Joseph, Jersey City, N. J.
Dragert Co., Inc., C. H., Dallas, Tex.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gasoilair Equipment Co., New Haven, Conn.
Greene, Tweed & Co., North Wales, Pa.
Grinnell Co., Inc., Providence, R. I.
Hercules Chemical Co., Inc., New York, N. Y.
Hetzel Roofing Products Co., Newark, N. J.
Highside Chemicals Co., Clifton, N. J.
Horn Co., Inc., A. C., Long Island City, N. Y.
Illinois Oil Products, Inc., Rock Island, Ill.
Jet-Lube, Inc., Burbank, Calif.
Johns-Manville, New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
Key Co., East St. Louis, Ill.
Keystone Asphalt Products Co., Chicago, Ill.
Krehbiel Co., J. H., Chicago, Ill.
Lake Chemical Co., Chicago, Ill.
Lastik Products Co., Inc., Pittsburgh, Pa.
Macksons Co., New York, N. Y.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Montgomery Bros., San Francisco, Calif.
National Engineering Products, Inc., Washington, D. C.
Nebel Mfg. Co., Cleveland, O.
Oil Equipment Mfg. Corp., New Haven, Conn.
Parker Appliance Co., The, Cleveland, O.
Pecora Paint Co., Inc., Philadelphia, Pa.
Permatex Co., Inc., Brooklyn, N. Y.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
Reilly Tar & Chemical Corp., Indianapolis, Ind.
Robinson Clay Product Co., The, Akron, O.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sauereisen Cements Co., Pittsburgh, Pa.
Saverite Engineering Co., Hoboken, N. J.
Schundler & Co., F. E., Long Island City, N. Y.
Smooth-On Mfg. Co., Jersey City, N. J.
Spring Packing Corp., Chicago, Ill.
Sulflo, Inc., Elizabeth, N. J.
Technical Products Co., Sharpsburg, Pa.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.
United States Stoneware Co., New York, N. Y.
Utility Laboratory, Inc., Brooklyn, N. Y.
Wilhelm Co., A., Reading, Pa.
X Laboratories, Inc., New York, N. Y.
X-Pando Corp., Long Island City, N. Y.

CEMENT, FURNACE

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Armstrong Co., Detroit, Mich.
Armstrong Cork Co., Lancaster, Pa.
Babcock & Wilcox Co., New York, N. Y.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chicago Fire Brick Co., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Clinton Metallic Paint Co., Clinton, N. Y. (Asbestos)
Continental Products Co., Euclid, O.
Foster Co., Benjamin, Philadelphia, Pa.
Green Fire Brick Co., Mexico, Mo.
Hercules Chemical Co., Inc., New York, N. Y.
Hetzel Roofing Products Co., Newark, N. J.
Johns-Manville, New York, N. Y.
Krehbiel Co., J. H., Chicago, Ill.
Laclede-Christy Co., St. Louis, Mo.
Lastik Products Co., Inc., Pittsburgh, Pa.
Nebel Mfg. Co., Cleveland, O.
Norton Co., Worcester, Mass.
Pecora Paint Co., Inc., Philadelphia, Pa.
Plastic Products Co., Detroit, Mich.
Plibrico Co., Chicago, Ill.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Ramtite Co., The, Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sall Mountain Co., Hamilton, O.
Sauereisen Cements Co., Pittsburgh, Pa.
Smooth-On Mfg. Co., Jersey City, N. J.
Standard Asbestos Mfg. Co., Chicago, Ill.
Standard Fuel Engineering Co., Detroit, Mich.
Tamms Industries, Inc., Chicago, Ill.
Taylor Sons Co., Charles, Cincinnati, O.
United States Stoneware Co., New York, N. Y.
Utility Laboratory, Inc., Brooklyn, N. Y.
Walsh Refractories Corp., St. Louis, Mo.

CEMENT, INSULATING

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa.
Asbestos Asphalt Insulation Co., Chicago, Ill.
Atlas Mineral Products Co., Mertztown, Pa.
Baldwin-Hill Co., Trenton, N. J. (mineral wool)
Bigelow-Liptak Corp., Detroit, Mich.
Bird-Archer Co., Philadelphia, Pa.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chicago Fire Brick Co., Chicago, Ill.
Eagle-Picher Co., Cincinnati, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Grant Wilson, Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
International Vermiculite Co., Girard, Ill.
Johns-Manville, New York, N. Y.
Keasbey Co., Robert A., New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa. (85 per cent magnesia)
Krehbiel Co., J. H., Chicago, Ill. (Asbestos, mineral wool)
Laclede-Christy Co., St. Louis, Mo.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Moore, Inc., Goodloe E., Danville, Ill.
Mundet Cork Corp., North Bergen, N. J.
Munn and Steele, Inc., South Boston, Mass.
National Engineering Products, Inc., Washington, D. C.
National Gypsum Co., Buffalo, N. Y.
Nelson Mfg. Co., B. F., Minneapolis, Minn.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Pabco Products Inc., San Francisco, Calif.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Peterson Co., B. A., Dowagiac, Mich.
Plibrico Co., Chicago, Ill.
Poe Co., C. W., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Ramtite Co., The, Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y.
Rex Clay Products Co., Detroit, Mich.
Ruberoid Co., New York, N. Y.
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sall Mountain Co., Hamilton, O.
Sauereisen Cements Co., Pittsburgh, Pa.
Schundler & Co., Inc., F. E., Long Island City, N. Y.
Smith & Kanzler Corp., Linden, N. J.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill.
Standard Fuel Engineering Co., Detroit, Mich.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Mineral Wool Co., Stanhope, N. J.
Walsh Refractories Corp., St. Louis, Mo.
Western Mineral Products Co., Minneapolis, Minn.
Zonolite Co., Chicago, Ill.

CENTRIFUGAL PUMPS

See Pumps, Centrifugal

CHAIN DRIVES

See Drives, Chain

CHAMBERS, COMBUSTION, PREFORMED

Armstrong Cork Co., Lancaster, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Boston Machine Works Co., Lynn, Mass.
France Refractories Co., J. H., Snow Shoe, Pa.
Grant Wilson Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
Henriksen Co., C. O., Chicago, Ill.
Laclede-Christy Co., St. Louis, Mo.
Monogram Products Co., Inc., Philadelphia, Pa.
Oil Equipment Mfg. Corp., New Haven, Conn.
Peterson Co., B. A., Dowagiac, Mich.
Preferred Utilities Mfg. Corp., New York, N. Y.
Refractory & Insulation Corp., New York, N. Y.
Rex Clay Products Co., Detroit, Mich.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Stuart Supply, Des Moines, Ia.
Walsh Refractories Corp., St. Louis, Mo.

CHAMBERS, TEST, CONTROLLED TEMPERATURE AND HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Anetsberger Brothers, Inc., Northbrook, Ill.
Cincinnati Sub-Zero Products Co., Cincinnati, O.
Drying Systems, Inc., Chicago, Ill.
Reco Products Div., Recony Corp., New York, N. Y.
Sub-Zero Freezer Co., Inc., Madison, Wis.
Tenney Engineering, Inc., Union, N. J.
York Corp., York, Pa.

CHANGERS, SPEED, HYDRAULIC COUPLING

American Blower Corp., Detroit, Mich.
CraneVeyor Corp., Los Angeles, Calif.
Link Belt Co., Chicago, Ill.
Link-Belt Co., Philadelphia, Pa.
Reuland Electric Co., Alhambra, Calif. (combined electric motor and fluid drive coupling)

CHANGERS, SPEED, MAGNETIC

Allis Co., Louis, The, Milwaukee, Wis.
Doerr Electric Corp., Cedarburg, Wis.
Electric Machinery Mfg. Co., Minneapolis, Minn.

CHANGERS, SPEED, MECHANICAL

Abart Gear & Machine Co., Chicago, Ill.
Allis Co., Louis, The, Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Cleveland Worm & Gear Co., Cleveland, O.
DoAll Co., The, Des Plaines, Ill.
Dodge Mfg. Corp., Mishawaka, Ind.
Doerr Electric Corp., Cedarburg, Wis.
Driv-Way Lite Co., Denver, Colo.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Horton Mfg. Co., Inc., Minneapolis, Minn.

Lewellen Mfg. Co., Columbus, Ind.
Lima Electric Motor Co., The, Lima, O.
Link Belt Co., Chicago, Ill.
Link-Belt Co., Philadelphia, Pa.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Master Electric Co., Dayton, O.
Morse Chain Co., Detroit, Mich.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Reeves Pulley Co., Columbus, Ind.
Reliance Electric & Engineering Co., Cleveland, O. (electrical & mechanical drives)
Speed Selector Inc., Cleveland, O.
Standard Transmission Equipment Co., Pasadena, Calif.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Wayne Manufacturing Co., Pomona, Calif.
Woods Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J.

CHASERS, PIPE AND BOLT

Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Toledo Pipe Threading Machine Co., Toledo, O.

CHASERS, THREADING DIE

Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Toledo Pipe Threading Machine Co., Toledo, O.

CHECK VALVES

See Valves, Check

CHILLERS, WATER, FOR AIR CONDITIONING AND REFRIGERATION

Acme Industries, Inc., Jackson, Mich.
Alstrom Corp., New York, N. Y.
Armstrong Co., Richard M., Westchester, Pa.
Bakeraire Corp., South Windham, Me.
Bell & Gossett Co., Morton Grove, Ill.
Borg-Warner Corp., Hydraline Products Div., Detroit, Mich.
Brown Fintube Co., The, Elyria, O.
Brunner Mfg. Co., Utica, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cool-Ette, Inc., Detroit, Mich.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St Louis, Mo.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering, Inc., Somerville, Mass.
Davis Engineering Corp., Elizabeth, N. J.
Dole Refrigeratng Co., Chicago, Ill.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Los Angeles, Calif.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Frick Co., Waynesboro, Pa.
Graham Mfg. Co., Inc., New York, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heatron, Inc., York, Pa.
Heat-X Inc., The, Brewster, N. Y.
Howe Ice Machine Co., Chicago, Ill.
Kennard Corp., St. Louis, Mo.
Mayer Refrigerating Engineers, Inc., Lincoln Park, N. J.
Niagara Blower Co., New York, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Economics Co., Inc., Canton, O.
Servel, Inc., Evansville, Ind.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Temprite Products Corp., Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Vilter Mfg. Co., The, Milwaukee, Wis.
Whitlock Mfg. Co., Hartford, Conn.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Yula Water Heaters, Inc., New York, N. Y.

CHILLERS, WATER, PACKAGED

See Compressors, Refrigerating, Combined with Condenser, Water Chiller, Piping Connections and Controls

CHLORINATORS, WATER

Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Precision Chemical Pump Corp., Waltham, Mass.

CIRCULATORS FOR HOT WATER HEATING SYSTEMS

Alliance Industries, Huntingden Valley, Pa.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Baseline Mfg. Co., Minneapolis, Minn.
Bell & Gossett Co., Morton Grove, Ill.
Chicago Pump Co., Chicago, Ill.
Columbus Steam Pump Works Co., Columbus, O.
Dayton Electric Mfg. Co., Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kainer & Co., Chicago, Ill.
Kehm Corp., The, Chicago, Ill.
Kraissl Co., Inc., The, Hackensack, N. J.
Magnaflow Pump Corp., New York, N. Y. (magnetically driven)
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Pumpenbay Brugg K. Rutschi, Brugg, Switzerland
Quality Specialty Co., Inc., Camden, N. J.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Weil Pump Co., Chicago, Ill.
White Flomatic Corp., Hoosick Falls, N. Y.

CLAMPS, BEAM, PIPE HANGING

Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Carpenter & Paterson, Inc., Cambridge, Mass.
Chicago Nipple Mfg. Co., Cicero, Ill.
Crawford Co., Chicago, Ill.
Farley Sleeve & Hanger Co., Cleveland, O.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Frick Co., Waynesboro, Pa.
Gateway Engineering Co., Chicago, Ill.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Providence, R. I.
Hupp Corp., Globe Stamping Div., Cleveland, O.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Moore, Inc., Goodloe E., Danville, Ill.
Mult-A-Frame Div., Ainsworth Mfg. Corp., Detroit, Mich.
National Valve & Mfg. Co., Pittsburgh, Pa.
Paine Co., Addison, Ill.
Rockwood Sprinkler Co., Worcester, Mass.
Unistrut Products Co., Chicago, Ill.
Walworth Co., New York, N. Y.

CLAMPS, HOSE

Allen Mfg. Co., W. D., Chicago, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Crane Co., Chicago, Ill.
Everhot Products Co., Chicago, Ill.
Flexible Tubing Corp., Guilford, Conn.
Goodall Rubber Co., Trenton, N. J.
Marman Products Co., Inc., Los Angeles, Calif.
Punch-Lok Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Thor Power Tool Co., Aurora, Ill.
Tinnerman Products, Inc., Cleveland, O.

CLAMPS, PIPE REPAIR

Adams Pipe Repair Products, El Monte, Calif.
Chelsea Metal Stamping Co., New York, N. Y.
Chicago Specialty Mfg. Co., Chicago, Ill.
Clow & Sons, James B., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Holoal Mfg. Co., Ridgewood, N. J.
Inner-Tite Div., of Yara Engineering Corp., Elizabeth, N. J.
Marman Products Co., Inc., Los Angeles, Calif.
Morris Coupling & Clamp Co., Ellwood City, Pa.
Pipe Line Development Co., Cleveland, O.
Rensselaer Valve Co., Cohoes, N. Y.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
Skinner Co., M. B., South Bend, Ind.
Yarnall-Waring Co., Philadelphia, Pa.

CLAMPS, PIPE, WELDING

Adjustable Clamp Co., Chicago, Ill.
Albert Pipe Supply Co., Brooklyn, N. Y.
Atlas Welding Accessories Co., Ferndale, Mich.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Detroit Stamping Co., Detroit, Mich.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Jewel Mfg. Co., St. Paul, Minn.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Trindl Products, Ltd., Chicago, Ill.
Williams & Co., J. H., Buffalo, N. Y.

CLEANERS, AIR, ELECTRICAL

Air-Maze Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
Dollinger Corp., Rochester, N. Y.
Electro-Air Cleaner Co., Los Angeles, Calif.
Radex Corp., Chicago, Ill.
Trion, Inc., McKees Rocks, Pa.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wilson Engineering Corp., Chicago, Ill.

CLEANERS, PIPE LINE, ELECTRICALLY DRIVEN

Ken-Way Corp., Sparta, Wis.

CLEANERS, TUBE

Arcee Products, Pawtucket, R. I. (copper fitting cleaning tool)
Chesterton Co., A. W., Everett, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Elliott Co., Jeannette, Pa.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Osborn Mfg. Co., Cleveland, O.
Mill-Rose Co., Cleveland, O.
Perfection Grate & Stoker Co., Springfield, Mass.
Pierce Co., Wm. B., The, Buffalo, N. Y.
Pilley Brush Co., Fort Madison, Ia.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Spencer Turbine Co., Hartford, Conn.
Wilson, Inc., Thomas C., Long Island City, N. Y.
York Corp., York, Pa.

CLEANERS, VACUUM, FOR BOILERS

Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Empire Chemical Products Co., Newark, N. J.
Ideal Industries, Inc., Sycamore, Ill.
Lamson Corp., Blower Div., Syracuse, N. Y.
Pullman Vacuum Cleaner Co., Boston, Mass.
Spencer Turbine Co., Hartford, Conn.

CLEANING COMPOUNDS

See Compounds, Cleaning, Pipe Coil and Condenser

CLEANING COMPOUNDS, AIR FILTER

See Compounds, Cleaning, Air Filter

CLEANING MACHINES, PIPE

See Machines, Pipe Cleaning; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

CLIPS, BALANCE, BLOWER WHEEL

Brookside Products Co., Inc., McCordsville, Ind.

CLOTH, TREATED, FOR DUST COLLECTORS

Canvas Products Co., St. Louis, Mo.
Menardi & Co., El Segundo, Calif.

COAL BURNERS

See Burners, Pulverized Coal; Stokers

COAL CONVEYORS

See Conveyors, Coal and Ash

COATINGS, PROTECTIVE, FOR METALS

Alrose Chemical Co., Providence, R. I.
Amercoat Corporation, South Gate, Calif.
American Chemical Paint Co., Ambler, Pa. (rust proofing chemicals)
American Hard Rubber Co., New York, N. Y. (rubber and plastic)
American Solder & Flux Co., Philadelphia, Pa. (Galvanizing powder)
Armstrong Cork Co., Lancaster, Pa. (asphalt for weather & low temperatures)
Atlas Mineral Products Co., Mertztown, Pa. (plastic)
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (Pitchbase and asphalt-base)
Bart Mfg. Corp., Belleville, N. J.
Blue Ridge Talc Co., Inc., Henry, Va.
Bonafide Genasco, Inc., New York, N. Y. (asphalt)
Brooklyn Varnish Mfg. Co., Brooklyn, N. Y.
Cabot Inc., Samuel, Boston, Mass. (Bituminous black paint)
Calbar Paint & Varnish Co., Philadelphia, Pa.
Carboline Co., The, St. Louis, Mo. (corrosion resisting)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asphalt and aluminum paints)
Chemical & Metallurgical Products, Inc., New York, N. Y. (zinc powder, galvanic corrosion, resistant, resealing)
Chemical Solvent Co., Birmingham, Ala.
Colonial Alloys Co., Metals Div., Philadelphia, Pa. (anodizing chemical oxidizing for aluminum)
Condenser Service & Engineering Co., Inc., Hoboken, N. J. (Metal spray)
Continental Products Co., Euclid, O. (paint)
Cordo Chemical Co., Norwalk, Conn.
Corrosite Div., Reliance Paint Co., Brooklyn, N. Y. (vinyl plastic)
Dampney Co., The, Boston, Mass.
Dearborn Chemical Co., Chicago, Ill. (Rust preventive)
Debevoise Co., The, Brooklyn, N. Y.
Devoe & Raynolds Co., Inc., New York, N. Y.
Dow Corning Corp., Midland, Mich.
du Pont de Nemours & Co. (Inc.), E. I., Finishes Div., Wilmington, Del.
Eagle-Picher Co., Cincinnati, O. (Waterproof insulating, red lead and blue lead)
Elraco Engineering Co., Los Angeles, Calif. (interior tank paint)
Flintkote Co., The, New York, N. Y. (Asphalt emulsions)
Flexrock Co., Philadelphia, Pa.
Flood Co., Hudson, O. (paint additive)
Foster Co., Benjamin, Philadelphia, Pa.
France Refractories, Co., J. H., Snow Shoe, Pa. (cast iron & steel)
Galv-Weld Products, Lima, O. (Regalvanizing)
Gates Engineering Co., Wilmington, Del.
Goodrich Co., B. F., Akron, O.
Haering & Co., Inc., D. W., San Antonio, Texas. (Drying and non-drying)
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Harco Corp., Cleveland, O. (corrosion protection for underground piping, process tanks, storage tanks, and radiant heating piping)
Hardy, Inc., Charles, New York, N. Y. (18-8 stainless steel paste)
Heresite & Chemical Co., Manitowoc, Wis. (Synthetic)
Hill, Hubbell & Co., Cleveland, O. (coating and wrap for pipe)
Horn Co., Inc., A. C., Long Island City, N. Y.
Houghton & Co., E. F., Philadelphia, Pa.
Industrial Metal Protectives, Inc., Dayton, O.
Insul-Mastic Corp., Pittsburgh, Pa. (asphaltic & plastic)
Interchemical Corp., Finishes Div., Newark, N. J.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Kellogg Co., M. W., The, New York, N. Y. (Heat resisting)
Knight, Maurice A., Akron, O. (Vinyl plastic base)
Koppers Co., Inc., Pittsburgh, Pa. (coal tar)
Lastik Products Co., Inc., Pittsburgh, Pa.
Lithcote Corp., Chicago, Ill.
Maas & Waldstein Co., Newark, N. J.
Markal Co., Chicago, Ill.
Master Mechanics Co., Cleveland, O.
Metalweld, Inc., Protective Coatings Div., Philadelphia, Pa. (linings for hot water tanks)
Midland Paint & Varnish Co., Cleveland, O.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., Detroit, Mich. (Sound dampening and insulating types as well as for protection against corrosion)
Miracle Adhesives, Corp., New York, N. Y.
Moore & Co., Samuel, Mantau, O. (plastic)
Mortell Co., J. W., Kankakee, Ill. (Asphalt)
Mundet Cork Corp., North Bergen, N. J. (plastic waterproof paint)
National Lead Co., New York, N. Y. (Red lead)
National Pipe Coatings, Inc., Huntington Park, Calif.
Nebel Mfg. Co., Cleveland, O.
Nelson Mfg. Co., B. F., Minneapolis, Minn.
Oakite Products, Inc., New York, N. Y.
Octagon Process, Inc., Staten Island, N. Y. (rust preventive oils, rust-proofing compounds)
Ohmlac Paint & Refining Co., Inc., New York, N. Y. (Acid resistant, heat resistant)
Palladium Mastic Corp. of America, Rutherford, N. J.
Penn Galvanizing Co., Philadelphia, Pa. (Galvanizing)
Pennsylvania Salt Mfg. Co., Philadelphia, Pa. (chlorinated hydrocarbon base, and liquid neoprene base)
Perolin Co., Inc., Chicago, Ill.
Pittsburgh Plate Glass Co., Pittsburgh, Pa. (Paint, varnish, lacquer)
Poe Co., C. W., The, Cleveland, O.
Polyken Products, Dept. of the Kendall Co., Chicago, Ill. (tape, plastic)
Porce-Lin Tank Lining Co, Detroit, Mich. (plastic & ceramic)
Presstite Engineering Co., St. Louis, Mo.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Reilly Tar & Chemical Corp., Indianapolis, Ind. (Coal tar base)
Ric-wiL Co., The, Barberton, O. (phenolic resin)
Robertson Co., H. H., Pittsburgh, Pa.
Rubber & Plastics Compound Co., New York, N. Y. (anticorrosive coating)
Rust-Oleum Corp., Evanston, Ill.
Saran Lined Pipe Co., Ferndale, Mich.
Saverite Engineering Co., Hoboken, N. J. (Tank coatings, rust preventive)
Schror, Dr. Adolph, East Orange, N. J.
Sherwin-Williams Co., The, Cleveland, O.
Sonneborn Sons, Inc., L., New York, N. Y.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga. (Metallic paint)
Special Chemicals Corp., Ossining, N. Y. (Aluminum paint)
Steelcote Mfg. Co., St. Louis, Mo.
Stewart-Warner Corp., Heating Div., Indianapolis, Ind. (ceramic)
Tapecoat Co., The, Evanston, Ill. (coal tar protective coating in tape form for pipe and fittings, insulated pipe underground and above ground)
Thompson and Co., Oakmont, Pa.
Tropical Paint & Oil Co., Cleveland, O.
Truscon Laboratories, Detroit, Mich. (alkyd and epoxy resin)
Turco Products, Inc., Los Angeles, Calif.
United Chromium, Inc., New York, N. Y. (Chemical resisting organic coatings)
United States Stoneware Co., New York, N. Y. (Corrosion resistant)
Vimasco Corp., Charleston, W. Va. (vinyl)
Watson-Standard Co., Pittsburgh, Pa.
Wilbur & Williams Co., Brighton, Mass.
Wilhelm Co., A., Reading, Pa.
Wolfe-Kote Co., Inc., Sheboygan, Wis.
X-Pando Corp., Long Island City, N. Y. (Anti-corrosive)

COCKS, BOILER GAGE

Bordo Co., Inc., L. J., Glenside, Pa.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Ernst Water Column & Gauge Co., Livingston, N. J.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Chicago, Ill.
Lonergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Nason Co., Clarkston, Mich.
Penberthy Injector Co., Detroit, Mich.
Perfex Corp., Milwaukee, Wis.
Powell Co., Wm., The, Cincinnati, O.
Reliance Gauge Column Co., Cleveland, O.
Strahman Valves, Inc., New York, N. Y.
Swift Lubricator Co., The, Elmira, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.
Wright-Austin Co., Detroit, Mich.

COILS

See Surface, Cooling; Surface, Heating

COILS, CONDENSATION

American District Steam Co., Inc., North Tonawanda, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
General Fittings Co., Providence, R. I.
Heatron, Inc., York, Pa.
Lewis & Co., Joseph E., Baltimore, Md.
Parker Appliance Co., The, Cleveland, O.
Trane Co., The, La Crosse, Wis.
Vilter Mfg. Co., The, Milwaukee, Wis.
Yula Water Heaters, Inc., New York, N. Y.

COILS, FOR HOT WATER STORAGE TANKS

Adams Co., The, Dubuque, Ia.
Alstrom Corp., New York, N. Y.
American Cooling Tower Co., Kansas City, Mo.
American District Steam Co., Inc., North Tonawanda, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Downingtown Iron Works, Downingtown, Pa.
Everhot Products Co., Chicago, Ill.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (ceramics)
General Fittings Co., Providence, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Howard Iron Works & Alberger Heater Div., Buffalo, N. Y.
Kewanee-Ross Corp., Kewanee, Ill.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
National Pipe Bending Co., New Haven, Conn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Perfex Corp., Milwaukee, Wis.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Pittsburgh Pipe Coil & Bending Co., Etna, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Tranter Mfg., Inc., Lansing, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters, Inc., New York, N. Y.

COILS AND PANELS, RADIANT HEATING AND COOLING, PREFABRICATED

Alstrom Corp., New York, N. Y.
American Brass Co., Waterbury, Conn.

Atlantic Pipe Bending and Fabricating Corp., Wood-Ridge, N. J.
Burgess-Manning Co., Chicago, Ill. (also for radiant cooling)
Capitol Mfg. & Supply Co., Columbus, O.
Carlon Products Corp., Cleveland, O. (headers)
Clow & Sons, James B., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Elmwood, Conn.
Crittall Radiant Heating, Inc., Richard, New York, N. Y.
Dole Refrigerating Co., Chicago, Ill.
Even-Ray Co., Inc., Newark, N. J.
Fricke, Fred J., Albuquerque, N. M.
Heat & Power Corp., Baltimore, Md.
Hi-Flow Products, Inc., Lindenhurst, N. Y.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
Meco, Inc., Portland, Ore.
National Pipe Bending Co., New Haven, Conn.
Nesbitt, Inc., John J., Philadelphia, Pa.
Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill. (roll bonded metal panels incorporating fluid passages)
Pan-L-Heat Corp., Portland, Ore.
Radiant Panel Mfg. Co., Torrington, Conn.
Sawhill Tubular Products, Inc., Sharon, Pa.
Simplex Ceiling Corp., New York, N. Y.
T & H Engineering Co., Little Ferry, N. J. (hammer and holding rig for installing ceiling heating coils)
Thermapanels, Inc., Santa Clara, Calif.

COILS, PIPE

Acme Industries, Inc., Jackson, Mich.
Albert Pipe & Supply Co., Brooklyn, N. Y.
American Cooling Towers Co., Kansas City, Mo.
Atlantic Pipe Bending and Fabricating Corp., Wood-Ridge, N. J.
B & M Mfg. Co., East Orange, N. J.
Bakeraire Corp., South Windham, Me.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Nipple Mfg. Co., Cicero, Ill.
Clow & Sons, James B., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Elmwood, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Corning Glass Works, Corning, N. Y.
Crane Co., Chicago, Ill.
Davis Engineering Corp., Elizabeth, N. J.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y. (lead, lead covered, and lead alloy)
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Flori Pipe Co., The, St. Louis, Mo.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Harris & Co., Arthur, Chicago, Ill.
Heil Process Equipment Corp., Cleveland, O. (Impervious Graphite)
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago.
Kopperman & Sons, Joseph, Philadelphia, Pa.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead covered)
Lewis & Co., Joseph E., Baltimore, Md.
Lumsden & Van Stone, Div. of Midwest Piping Co., Inc., South Boston, Mass.
Marlo Coil Co., St. Louis, Mo.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Philadelphia Pipe Bending Co., Philadelphia.
Pittsburgh Pipe Coil & Bending Co., Etna, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Rempe Co., Chicago, Ill.
Reynolds Mfg. Co., Inc., Springfield, Mo.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Sawhill Tubular Products, Inc., Sharon, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Shaw-Kendall Engineering Co., Toledo, O.
Tranter Mfg., Inc., Lansing, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Wallace Supplies Mfg. Co., Chicago, Ill.
Western Piping & Engineering Co., Inc., San Francisco, Calif.
Whitlock Mfg. Co., Hartford, Conn.
York Corp., York, Pa.

COLLECTION, DUST AND FUME, ULTRASONIC

Ultrasonic Corp., Cambridge, Mass.

COLLECTORS, DUST

Aerotec Corp., The, Greenwich, Conn.
Aget-Detroit Co., Ann Arbor, Mich.
Allington & Curtis Mfg. Co., Saginaw, Mich. (centrifugal & bag)
American Air Filter Co., Inc., Louisville, Ky.
American Blow Pipe Co., Chicago, Ill. (shavings and sawdust)
American Blower Corp., Detroit, Mich.
American Wheelabrator & Equipment Corp., Mishawaka, Ind. (cloth-tube type)
Baker Co., Inc., Maplewood, Me. (portable)
Banister Co., Inc., A. W., Cambridge, Mass.
Blower Application Co., Milwaukee, Wis.
Bubar Dust Systems, Inc., Old Lyme, Conn. (mechanical)
Buell Engineering Co., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y. (wet & dry)
Carolina Blower Co., Inc., Greensboro, N. C.
Centri-Spray Corp., Livonia, Mich. (Wet type)
Chicago Blower Corp., Franklin Park, Ill. (centrifugal)
Cincinnati Electrical Tool Co., The, Cincinnati, O. (self contained)
Clark Dust Control Co., Chicago, Ill.
Columbian Steel Tank Co., Kansas City, Mo.
Day Co., The, Minneapolis, Minn.
Ducon Co., The, Mineola, N. Y. (Cyclone, centrifugal wash, and bag type)
Dust Filter Co., Chicago, Ill.
Dust Suppression & Engineering Co., Lake Orion, Mich.
Dustex Corp., Buffalo, N. Y. (mechanical)
Farr Co., Los Angeles, Calif. (cyclonic)
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Goethel Sheet Metal Wks., Alfred, Milwaukee, Wis.
Green Fuel Economizer Co., Beacon, N. Y. (dry type)
Griffin & Co., Inc., Louisville, Ky.
Indiana Fan Company, Indianapolis, Ind.
Jacobs Co., Inc., B. & J., Cincinnati, O.
Kirk & Blum Mfg. Co., Cincinnati, O.
Kluegel & Co., E., St. Paul, Minn.
Koppers Company, Inc., Metal Products Div., Baltimore, Md. (electrostatic)
Lamson Corp., Blower Div., Syracuse, N. Y.
Lumm Co., A. H., Toledo, O.
Mahon Co., R. C., The, Detroit, Mich. (dry inertia, air washers, fog filters)
Johnson March, Philadelphia, Pa.
Newcomb-Detroit Co., Detroit, Mich. (recirculating water type)
Northern Blower Co., Cleveland, O.
Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I. (bag type)
Pangborn Corp., Hagerstown, Md. (cloth filter)
Peters-Dalton, Inc., Detroit, Mich.
Prat-Daniel Corp., South Norwalk, Conn.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Research Corp., New York, N. Y.
Ruemelin Mfg. Co., Milwaukee, Wis.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Schmieg Industries, Detroit, Mich.
Schneible Co., Claude B., Detroit, Mich.
Sly Mfg. Co., W. W., Cleveland, O.
Spencer Turbine Co., Hartford, Conn.
Sprout-Waldron & Co., Muncy, Pa.
Torit Mfg. Co., St. Paul, Minn. (cloth filter and centrifugal separator)
Wagner Awning & Mfg. Co., Cleveland, O. (Dust recovery bags)
Western Blower Co., Seattle, Wash.
Western Precipitation Corp., Los Angeles, Calif.
Winkler & Sons, Inc., A. E., Milwaukee, Wis.
Young & Bertke Co., Cincinnati, O.

COLORIMETERS

American Instrument Co., Inc., Silver Spring, Md.
Bausch & Lomb Optical Co., Rochester 2, N. Y.
Daigger & Co., A., Chicago, Ill.
Ellison Draft Gage Co., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
O'Brien Industries, Caldwell, N. J.
Photovolt Corp., New York, N. Y.
Will Corp., Rochester, N. Y.

COMBUSTION CHAMBERS

See Chambers, Combustion, Preformed

COMBUSTION CONTROL

See Controls, Draft, Barometric; Regulators, Draft, Combustion; Systems, Combustion Control

COMBUSTION RECORDERS

See Recorders, Carbon Dioxide

COMBUSTION TESTING KITS

See Kits, Combustion Testing; Analyzers, Carbon Dioxide, Portable; Testers, Smoke

COMPOUNDS, AIR FRESHENING

Air-Aid Corp., Boston, Mass.
Aireactor Corp., New York, N. Y.
Airkem, Inc., New York, N. Y.
Ampion Corp., Long Island City, N. Y.
Carbide and Carbon Chemicals Co., A Division of Union Carbide and Carbon Corp., New York, N. Y.
Lord & Clark Co., Inc., Boston, Mass.

COMPOUNDS, ANTI-FREEZE, FOR SNOW MELTING COILS

Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
du Pont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del.
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Solvay Process Div., Allied Chemical & Dye Corp., New York, N. Y.

COMPOUNDS, BOILER CLEANING

Agava Products, Inc., Jersey City, N. J.
Agnew & Tomlinson, Long Island City, N. Y.
American Chemical Paint Co., Ambler, Pa.
American K. A. T. Corp., Garwood, N. J.
American Sand-Banum Co., Inc., New York, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Continental Products Co., Euclid, O.
Dearborn Chemical Co., Chicago, Ill.
Diamond Chemical Products, New York, N. Y.
Dowell Inc., Tulsa, Okla.
Elraco Engineering Co., Los Angeles, Calif.
Grief, Edward C., Bogota, N. J.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hagan Corp., Pittsburgh, Pa.
Hercules Chemical Co., Inc., New York, N. Y.
Hood Refining Co., Greensburg, Pa.
Houghton & Co., E. F., Philadelphia, Pa.
Kenite Laboratory, Inc., Madison, N. J.
Kewanee-Ross Corp., Kewanee, Ill.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Krehbiel Co., J. H., Chicago, Ill.
MacDermid Chemical Co., Bristol, Conn.
McMillan Industrial Supplies, C. C., Portland, Ore.
Madden Corp., The, Chicago, Ill.

Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Moreheat Distribution, Inc., Cincinnati, O.
North American Fibre Products Co., The, Cleveland, O.
O'Brien Industries, Caldwell, N. J.
Octagon Process, Inc., Staten Island, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Permutit Co., New York, N. Y.
Perolin Co., Inc., Chicago, Ill.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Saverite Engineering Co., Hoboken, N. J.
Schror, Dr. Adolph, East Orange, N. J.
Solvay Process Div., Allied Chemical & Dye Corp., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond Co., Cleveland, O.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Utility Laboratory, Inc., Brooklyn, N. Y.
Warren Refining & Chemical Co., The, Cleveland, O.
Water Control Engineering Co., Kansas City, Mo.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Co. of America, Pittsburgh, Pa.
Western Chemical Co., Kansas City, Mo.
X Laboratories, Inc., New York, N. Y.

COMPOUNDS, BOILER AND RADIATOR SEALING

Ampion Corp., Long Island City, N. Y.
Arco Co., The, Cleveland, O.
Atlas Chemical Co., Marietta, O.
Black & White Chemical Co., New York, N. Y.
Blue Seal Chemical Co., Roselle Park, N. J.
Cannon Chemical Co., Inc., Cambridge, Mass.
Chemical Solvent Co., Birmingham, Ala.
Chicago Specialty Mfg. Co., Chicago, Ill.
Desolvo Co., The, Pittsburgh, Pa.
Diamond Chemical Products, New York, N. Y.
Hampton-Cross Co., The, Louisville, Ky.
Hercules Chemical Co., Inc., New York.
Kenite Laboratory, Inc., Madison, N. J.
Krehbiel Co., J. H., Chicago, Ill.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
National Engineering Products, Inc., Washington, D. C.
Quigley Co., Inc., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sulflo, Inc., Elizabeth, N. J.
Utility Laboratory, Inc., Brooklyn, N. Y.
X Laboratories, Inc., New York, N. Y.

COMPOUNDS, CLEANING, AIR FILTER

Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York, N. Y.
Dollinger Corp., Rochester, N. Y.
Madden Corp., Chicago, Ill.
National Aniline Div., Allied Chemical & Dye Corp., New York, N. Y.
Oakite Products, Inc., New York, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Turco Products, Inc., Los Angeles, Calif.

COMPOUNDS, CLEANING, PIPE COIL AND CONDENSER

Agava Products, Inc., Jersey City, N. J.
American Chemical Paint Co., Ambler, Pa.
American Sand-Banum Co., Inc., New York, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Blue Seal Chemical Co., Roselle Park, N. J.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carolina Aniline & Extract Co., Inc., Charlotte, N. C.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Dearborn Chemical Co., Chicago, Ill.
Dowell, Inc., Tulsa, Okla.
Elraco Engineering Co., Los Angeles, Calif.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hercules Chemicals Co., Inc., New York, N. Y.
MacDermid Chemical Co., Bristol, Conn.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
National Aniline Div., Allied Chemical & Dye Corp., New York, N. Y.
North American Fibre Products Co., The, Cleveland, O.
Oakite Products, Inc., New York, N. Y.
Octagon Process, Inc., Staten Island, N. Y.
Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Perolin Co., Inc., Chicago, Ill.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Turco Products, Inc., Los Angeles, Calif.
Water Control Engineering Co., Kansas City, Mo.
Water Treatment Co. of America, Pittsburgh, Pa.
Western Chemical Co., Kansas City, Mo.

COMPOUNDS, WELDING

Allen Co., Inc., L. B., Chicago, Ill.
Allied Weld-Craft, Inc., Indianapolis, Ind.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American Solder & Flux Co., Philadelphia, Pa.
Atlas Welding Accessories Co., Ferndale, Mich.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Marquette Mfg. Co., Minneapolis, Minn.
Metal & Thermit Corp., New York, N. Y.
Midland Paint & Varnish Co., Cleveland, O.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif.
Modern Engineering Co., St. Louis, Mo.
Powder Weld Process Co., The, Brooklyn, N. Y. (Powdered)
Presstite Engineering Co., St. Louis, Mo.
Sight Feed Generator Co., West Alexandria, O.
Solar Aircraft Co., San Diego, Calif.
Special Chemicals Corp., Ossining, N. Y.
Thompson and Co., Oakmont, Pa.
Turco Products, Inc., Los Angeles, Calif.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Wolfe-Kote Co., Inc., Sheboygan, Wis.

COMPRESSED AIR DEHUMIDIFIERS

See Dehumidifiers for Compressed Air

COMPRESSED AIR MOTORS

See Motors, Compressed Air Powered

COMPRESSOR BASES

See Bases and Pads, Vibration Isolating

COMPRESSOR PARTS

See Parts, Compressor

COMPRESSOR SEALS

See Seals, Terminal, for Compressors

COMPRESSORS, AIR

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Beach-Russ Co., New York, N. Y.
Binks Mfg. Co., Chicago, Ill.
Brunner Mfg. Co., Utica, N. Y.
Bury Compressor Co., Erie, Pa.
Chicago Pneumatic Tool Co., New York, N. Y.
Clark Bros. Co., Inc., Div. of Dresser Industries, Olean, N. Y.
Cleaver-Brooks Co., Milwaukee, Wis.
Cooper-Bessemer Corp., Mt. Vernon, O.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Davey Compressor Co., Kent, O.
Dayton Air Compressor Co., The, Dayton, O.
DeVilbiss Co., The, Toledo, O.
Electric Sprayit Div., Thomas Industries Inc., Sheboygan, Wis.
Essick Mfg. Co., Los Angeles, Calif.
Fuller Co., Catasauqua, Pa.
Gardner-Denver Co., Quincy, Ill.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Ingersoll-Rand Co., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Joy Mfg. Co., Pittsburgh, Pa.
Kraissl Co., Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Lamson Corp., Blower Div., Syracuse, N. Y.
Lynch Corp., Anderson, Ind.
M & E Mfg. Co., Indianapolis, Ind.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Nash Engineering Co., South Norwalk, Conn.
North Penn Co., New York, N. Y.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Roots-Connersville Blower Div., Connersville, Ind.
Schramm, Inc., West Chester, Pa.
Spencer Turbine Co., Hartford, Conn.
Union Steam Pump Co., Battle Creek, Mich.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Wayne Pump Co., Salisbury, Md.
Wilson Co., K. R., Buffalo, N. Y.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

COMPRESSORS, REFRIGERATING, CENTRIFUGAL

Brunner Co., The, Gainesville, Ga.
Carrier Corp., Syracuse, N. Y. (Carrene)
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Trane Co., The, LaCrosse, Wis.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

COMPRESSORS, REFRIGERATING, COMBINED WITH CONDENSER, WATER CHILLER, PIPING CONNECTIONS, AND CONTROLS

American Coils Co., Newark, N. J.
American Motors Corp., Nash Kelvinator Corp., Detroit, Mich.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Brown Products Co., Forrest Hills, N. Y.
Brunner Mfg. Co., Utica, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Cool-Ette, Inc., Detroit, Mich.
Diceler Div. of General Machine & Mfg. Co., Berwick, Pa.
Drayer-Hanson, Inc., Los Angeles, Calif.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Frick Co., Waynesboro, Pa.
Heat-X, Inc., Brewster, N. Y.
Lehigh Mfg. Co., Div. of Lehigh Foundries, Inc., Lancaster, Pa.
Mayer Refrigerating Eng., Inc., Lincoln Park, N. J.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Primor Products, Inc., Adrian, Mich.
Refrigeration Economics Co., Inc., Canton, O.
Schnacke, Inc., Evansville, Ind.
Tecumseh Products Co., Tecumseh, Mich.
Temprite Products Corp., Dept. HPAC, Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., The, Milwaukee, Wis.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

COMPRESSORS, REFRIGERATING, RECIPROCATING

American Motors Corp., Nash Kelvinator Corp., Detroit, Mich.
Bakeraire Corp., South Windham, Me. ("Freon," Methyl chloride, Ammonia)
Brunner Mfg. Co., Utica, N. Y. (Methyl chloride, "Freon," sulphur dioxide)
Carrier Corp., Syracuse, N. Y. ("Freon")
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O. (Radial)
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Copeland Refrigeration Corp., Sidney, O.
Curtis Refrigeration Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Diceler Div. of General Machine & Mfg. Co., Berwick, Pa.
Frick Co., Waynesboro, Pa. (Ammonia, "Freon")
Frigidaire Div., General Motors Corp., Dayton, O.
General Machine & Mfg. Co., Berwick, Pa.
General Machinery Co., Spokane, Wash.
Ingersoll-Rand Co., New York, N. Y.

Kauffman Air Conditioning Corp., St. Louis, Mo.
Lehigh Mfg. Co., Div. of Lehigh Foundries, Inc., Lancaster, Pa.
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Ready-Power Co., The, Detroit, Mich. (radial unit driven by direct-connected internal combustion engine)
Reliance Refrigerating Machine Co., Chicago, Ill. ("Freon," methyl chloride, ammonia)
Reynolds Mfg. Co., Inc., Springfield, Mo.
Schnacke, Inc., Evansville, Ind.
Servel, Inc., Evansville, Ind.
Stewart Ice Machine Co., Pomona, Calif.
Tecumseh Products Co., Tecumseh, Mich.
Trane Co., The, LaCrosse, Wis.
U. S. Thermo Control Co., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis. ("Freon" ammonia)
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa. (Carbon dioxide, ammonia, "Freon")

COMPRESSORS, REFRIGERATING, STEAM JET

Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engrg. Co., Inc., New York, N. Y.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Graham Mfg. Co., Inc., New York, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Kewanee-Ross Corp., Kewanee, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

COMPRESSORS, STEAM BOOSTER

Bury Compressor Co., Erie, Pa.
Graham Mfg. Co., Inc., New York, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Worthington Corp., Harrison, N. J.

CONCRETE, INSULATING, FOR UNDERGROUND PIPING

Dockstader, Inc., S. E., Washington, D. C.
Munn and Steele, Inc., South Boston, Mass.
Zonolite Co., Chicago, Ill.

CONDENSATE DISPOSAL UNITS

See Pumps, Condensate, For Removing Condensation From Air Conditioning Units

CONDENSATE RETURN

See Pumps, Condensation Return; Systems, Condensate Return

CONDENSATION METERS

See Meters, Condensation

CONDENSATION PUMPS

See Pumps, Condensation

CONDENSER TUBES

See Tubes, Condenser

CONDENSERS, REFRIGERATING, AIR COOLED

Blazer, M. & Son, Passaic, N. J. (to 50 tons)
Bush Mfg. Co., West Hartford, Conn. (1/6 hp to 3 hp)
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Drayer-Hanson, Inc., Los Angeles, Calif. (1 to 10 tons)
Fedders-Quigan Corp., Buffalo, N. Y.
Heat-X Inc., Brewster, N. Y. (1/3 hp to 5 hp)
Kauffman Air Conditioning Corp., St. Louis, Mo. (2-50 tons)
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kramer Trenton Co., Trenton, N. J.
Marlo Coil Co., St. Louis, Mo. (1 to 20 tons)
McCord Corp., Detroit, Mich. (to 3 HP)
McQuay, Inc., Minneapolis, Minn. (2 to 15 HP)
Peerless of America, Inc., Chicago, Ill.
Perfex Corp., Milwaukee, Wis.
Refrigeration Appliances, Inc., Chicago, Ill. (2 to 10 tons)
Rittling Corp., The, Buffalo, N. Y. (up to 7½ hp)
Rome-Turney Radiator Co., Rome, N. Y.
Tenney Engineering, Inc., Union, N. J.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., The, Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.

CONDENSERS, REFRIGERATING, EVAPORATIVE

Acme Industries, Inc., Jackson, Mich.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
Bakeraire Corp., South Windham, Me.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Blazer, M. & Son, Passaic, N. J.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y. ("Freon," ammonia)
Chrysler Airtemp, Div. of Chrylser Corp., Dayton, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crowell & Dunn, Inc., New York, N. Y.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Drayer-Hanson, Inc., Los Angeles, Calif.
Frick Co., Waynesboro, Pa.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Harry Cooling Towers, Inc., New York, N. Y.
Kauffman Air Conditioning Corp., St. Louis, Mo. (2-50 tons)
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Niagara Blower Co., New York, N. Y.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Servel, Inc., Electric Refrigeration Div., Evansville, Ind.
Silco Products, Inc., Minneapolis, Minn.
Super-Cold Corp., Los Angeles, Calif.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Yorktowne Machine Co., York, Pa.

CONDENSERS, REFRIGERATING, SHELL AND COIL

Acme Industries, Inc., Jackson, Mich.
Autorad Inc., Chicago, Ill.
Bakeraire Corp., South Windham, Me.
Brown Fintube Co., The, Elyria, O.
Carrier Corp., Syracuse, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Davis Engineering Corp., Elizabeth, N. J.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Edwards Engineering Corp., Pompton Plains, N. J.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
General Fittings Co., Providence, R. I.
Halstead & Mitchell, Pittsburgh, Pa. (Double tube)
Heat-X Inc., Brewster, N. Y.
Heatron, Inc., York, Pa.
Heil Process Equipment Corp., Cleveland, O.
Howe Ice Machine Co., Chicago, Ill.
Lehigh Mfg. Co., Div. of Lehigh Foundries, Inc., Lancaster, Pa.
Nooter Corp., St. Louis, Mo.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Economics Co., Inc., Canton, O.
Rome-Turney Radiator Co., Rome, N. Y.
Super-Cold Corp., Los Angeles, Calif.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitlock Mfg. Co., Hartford, Conn.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., New York, N. Y.

CONDENSERS, REFRIGERATING, SHELL AND TUBE

Acme Industries, Inc., Jackson, Mich.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Andale Co., Philadelphia, Pa.
Autorad Inc., Chicago, Ill.
Armstrong Co., Richard M., Westchester, Pa.
Bakeraire Corp., South Windham, Me.
Bell & Gossett Co., Morton Grove, Ill.
Biggs Boiler Works Co., E., Akron, O.
Brown Fintube Co., The, Elyria, O.
Carrier Corp., Syracuse, N. Y. (Carrene)
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Davis Engineering Corp., Elizabeth, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Frick Co., Waynesboro, Pa.
General Heaters & Regulators Co., East Chicago, Ind.
Howard Iron Works & Alberger Heater Div., Buffalo, N. Y.
Howe Ice Machine Co., Chicago, Ill.
Kewanee-Ross Corp., Kewanee, Ill.
Manning & Lewis Engineering Co., Newark, N. J.
National Radiator Co., The, Johnstown, Pa.
Nooter Corp., St. Louis, Mo.
Ohio Pipe Bending & Machine Co., Cleveland, O.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Reco Products Div., Recony Corp., New York.
Refrigeration Economics Co., Inc., Canton, O.
Reliance Refrigerating Machine Co., Chicago, Ill.
Reynolds Mfg. Co., Inc., Springfield, Mo.
Roessing Mfg. Co., Pittsburgh, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Standard Refrigeration Co., Chicago, Ill.
Stewart Ice Machine Co., Pomona, Calif.
Superior Combustion Industries, Inc., New York, N. Y.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
Union Steam Pump Co., Battle Creek, Mich.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Whitlock Mfg. Co., Hartford, Conn.
Wittenmeier Machinery Co., Chicago, Ill.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., New York, N. Y.

CONDENSERS, WATER DISTRIBUTORS FOR

See Distributors, Water, for Condensers

CONDENSING UNITS

See Compressors

CONDUCTORS AND PANELS, ELECTRICAL, FOR RADIANT HEATING

Berko Electric Co., Queens Village, N. Y.
Continental Radiant Glass Heating Corp., New York, N. Y.
Electradiant Corp., Monterey, Calif.
Electriglas Corp., Bergenfield, N. J. (electric glass panels)
Electromode Corp., Rochester, N. Y.
Roberson Co., L. N., Seattle, Wash.
ThermoRay Corp., Irvington-On-Hudson, N. Y.
United States Rubber Co., New York, N. Y.
Wiegand Co., Edwin L., Pittsburgh, Pa.

CONDUIT, UNDERGROUND PIPING

Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Dockstader, Inc., S. E., Washington, D. C.
Durant Insulated Pipe Co., Palo Alto, Calif.
Durant International Corp., Williamstown, N. J.
Johns-Manville, New York, N. Y.
Kaiser Co., E. B., Glenview, Ill.
Michigan Pipe Co., Bay City, Mich.
Mundet Cork Corp., North Bergen, N. J.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Porter & Co., Inc., H. W., Newark, N. J.
Ric-wiL Co., The, Barberton, O.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Stillwater Clay Products Co., The, Cleveland, O.
Universal Sewer Pipe Co., Cleveland, O.
Water Tight Underground Conduit, Houston, Tex.

CONNECTIONS, DUCT, FLEXIBLE (ASBESTOS, CANVAS, ETC.)

Canvas Products Co., St. Louis, Mo.
Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Elgen Mfg. Corp., Long Island City, N. Y.
Felters Company, The, Boston, Mass.
Flexaust Co., New York, New York
Flexonics Corp., Maywood, Ill.
Grant Wilson Inc., Chicago, Ill.
St. Clair Rubber Co., Detroit, Mich.
Sall Mountain Co., Hamilton, O.
United States Rubber Co., New York, N. Y.
Ventfabrics Inc., Chicago, Ill.
Wagner Awning & Mfg. Co., Cleveland, O.
Wiremold Co., Hartford, Conn.

CONNECTORS, FILLING, HYDROSTATIC TEST

Mechanical Products Corp., Chicago, Ill.
Roylyn, Inc., Glendale, Calif.

CONNECTORS, FOR NON-METALLIC DUCT FABRICATION

Acme Steel Co., Chicago, Ill. (Strapping)
Lumm Co., A. H., Toledo, O.
United States Rubber Co., New York, N. Y.

CONTINUOUS HEATERS

See Heaters, Steam Jet, for Liquids

CONTROL, FOR INDIRECT WATER HEATERS

Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Bristol Co., The, Waterbury, Conn.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Detroit Controls Corp., Detroit, Mich.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jordan Regulator Corp., Cincinnati, O.
Klipfel Valves, Inc., Hamilton, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Watts Regulator Co., Lawrence, Mass.

CONTROL SYSTEMS, PRE-ASSEMBLED AS UNITS, FOR HEATING, COOLING AND VENTILATING

Factory Assemblies Using Other Manufacturers' Valves, Thermostats, Damper Motors, etc.

American Moistening Co., Providence, R. I.
Automatic Devices Co., Inc., Western Springs, Ill.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Barnes & Jones, Inc., Boston, Mass.
Bristol Co., The, Waterbury, Conn.
Carvell Heat Equipment Co., Los Angeles, Calif.
Dunham Co., C. A., Chicago, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Master Control Co., The, Cuyahoga Falls, O.
Midwest Air Conditioning Co., Des Moines, Ia.
Midwest Automatic Control Co., Des Moines, Ia.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa. (package heat)
Ray Oil Burner Co., San Francisco, Calif.
Webster & Co., Warren, Camden, N. J.
West Instrument Corp., Chicago, Ill.

CONTROLLERS AND STARTERS, MOTOR

ACEC Electric Corp., New York, N. Y.
Airgard Mfg. Co., Chicago, Ill.
Allen-Bradley Co., Milwaukee, Wis.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elec. Co., Hartford, Conn.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Chase-Shawmut Co., Newburyport, Mass.
Clark Controller Co., Cleveland, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Ebert Electronics Corp., Queens Village, N. Y.
Electric Controller & Mfg. Co., Cleveland, O.
Electric Machinery Mfg. Co., Minneapolis, Minn.
Furnas Electric Co., Batavia, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
Ideal Electric & Mfg. Co., Mansfield, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Monitor Controller Co., The, Boston, Mass.
Penn Controls, Inc., Goshen, Ind.
Potter & Brumfield Sales Co., Princeton, Ind.
Radex Corp., Chicago, Ill.
Reynolds Electric Co., River Grove, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Struthers-Dunn, Inc., Pitman, N. J.
United Electric Controls Co., Watertown, Mass.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Zenith Electric Co., Chicago, Ill.

CONTROLS, AIR CONDITIONING

See Humidistats; Indicator-Controllers; Operators, Damper; Operators, Valve; Recorder-Controllers; Rugulators; Relays; Switches; Thermostats; Valves, Diaphragm; Valves, Refrigeration; Valves, Solenoid

CONTROLS, DOOR, ELECTRIC EYE (FOR AIR CONDITIONED ROOMS)

Barber-Colman Co., Rockford, Ill.
De-Tec-Tronic Laboratories, Inc., Chicago, Ill.
Stanley Works, The, New Britain, Conn.
Sterns-Flinn Corp., New York, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Worner Electronic Devices, Rankin, Ill.

CONTROLS, DRAFT, BAROMETRIC

Ace Instrument Co., Inc., Brooklyn, N. Y.
Boston Machine Works Co., Lynn, Mass.
Bristol Co., The, Waterbury, Conn.
Cleveland Fuel Equipment Co., Cleveland, O.
Cole-Sewell Engineering Co., St. Paul, Minn.
Combustion Equipment Co., Silvis, Illinois
Empire Ventilation Equipment Co., Long Island City, N. Y.
Ess Instrument Co., Bergenfield, N. J.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Fuelguard Co., Dallas, Tex.
Fuel Reduction Corp., Chicago, Ill.
Hays Corp., Michigan City, Ind.
Hotstream Heater Co., Cleveland, O.
Krueger Sentry Gauge Co., Green Bay, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Perfex Corp., Milwaukee, Wis.
Preferred Utilities Mfg. Corp., New York, N. Y.
Salina Metal Products Co., Salina, Kan.
Simplex Mfg. Co., Fond du Lac, Wis.
Steinen Mfg. Co., Wm., Newark, N. J.
Windmaster Corp., Columbus, O.

CONTROLS, FIRE PROTECTION SPRINKLER SYSTEMS

Allen Mfg. Co., W. D., Chicago, Ill.
American District Telegraph Co., New York, N. Y.
Automatic Control Co., St. Paul, Minn.
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa.
Clark Controller Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Synchro-Start Products, Inc., Skokie, Ill.

CONTROLS, FLAME FAILURE

American District Telegraph Co., New York, N. Y.
Bressler Engineering Service, Oregon, Ill.
Bristol Co., The, Waterbury, Conn.
Combustion Control Div., Electronics Corp. of America, Boston, Mass.
De-Tec-Tronic Laboratories, Inc., Chicago, Ill.
Drying Systems, Inc., Chicago, Ill.
Ess Instrument Co., Bergenfield, N. J.
Fenwal Inc., Ashland, Mass.
Fuelguard Co., Dallas, Tex.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Haney Gas Burner & Engrs., Monrovia, Calif.
Mercoid Corp., The, Chicago, Ill.
Mettler Co., Inc., The, Los Angeles, Calif.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Webster Engineering Co., Tulsa, Okla.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
White-Rodgers Electric Co., St. Louis, Mo.

CONTROLS, HEATING

See Alarms; Humidistats; Indicator-Controllers; Operators, Damper; Operators, Valve; Recorder-Controllers; Regulators; Relays; Switches; Systems, Combustion Control; Systems, Heating; Thermostats; Valves, Balancing, Radiator; Valves, Diaphragm; Valves, Flow Control; Valves, Mixing; Valves, Pressure Reducing and Regulating; Valves, Radiator; Valves, Solenoid

CONTROLS, PUSH-PULL

See Shafts, Flexible, Push-Pull, for Control

CONTROLS, REFRIGERATION

See Humidistats; Operators, Valve; Relays; Switches; Thermostats; Valves, Refrigeration; Valves, Solenoid

CONVECTORS

See Radiation, Convection Type

CONVERTORS, STEAM

Alstrom Corp., New York, N. Y.
American District Steam Co., Inc., North Tonawanda, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
General Fittings Co., Providence, R. I.

General Heaters & Regulators Co., East Chicago, Ind.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Richmond Engineering Co., Inc., Richmond, Va.
Yula Water Heaters, Inc., New York, N. Y.

CONVEYORS, COAL AND ASH

Ajax Flexible Coupling Co., Westfield, N. Y.
American Coal Burner and Wood Stoker Corp., Chicago, Ill.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I. (continuous weighing)
Canton Stoker Corp., Canton, O.
Chain Belt Co., Milwaukee, Wis.
Chicago Fire Brick Co., Chicago, Ill.
Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, O.
CraneVeyor Corp., Los Angeles, Calif.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Farquhar Co., A. B., Div. of The Oliver Co., York, Pa.
Hager Bros., Rockford, Ill.
Hewitt-Robins, Inc., Hewitt Rubber Div., Buffalo, N. Y.
Jeffrey Mfg. Co., Columbus, O.
Johnston & Jennings Co., Cleveland, O.
Joy Mfg. Co., Pittsburgh, Pa.
Link-Belt Co., Chicago, Ill.
Spurgeon Co., Van Dyke, Mich.
Standard Transmission Equipment Co., Pasadena, Calif.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Whitty Co., Inc., Boston, Mass.

COOLERS, CRANE CAB

Dravo Corp., Pittsburgh, Pa.
Lintern Corp., Painesville, O.
Refrigeration Economics Co., Inc., Canton, O.
Trane Co., The, LaCrosse, Wis.

COOLERS, EVAPORATIVE

See Units, Air Conditioning, Summer, Evaporative Cooling Type

COOLERS, OIL

Acme Industries, Inc., Jackson, Mich.
American Cooling Tower Co., Kansas City, Mo.
American District Steam Co., Inc., North Tonawanda, N. Y.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Andale Co., Philadelphia, Pa.
Armstrong Co., Richard M., Westchester, Pa.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., The, Elyria, O.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Fluor Corp., Ltd., The, Los Angeles, Calif.
G & O Mfg. Co., New Haven, Conn.
General Heaters & Regulators Co., East Chicago, Ind.
Gilbert Brass Foundry Co., St. Louis, Mo.
Graham Mfg. Co., Inc., New York, N. Y.
Griscom-Russell Co., The, Masaillon, O.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Howard Iron Works & Alberger Heater Div., Buffalo, N. Y.
Kellog Co., The, M. W., New York, N. Y.
Kewanee-Ross Corp., Kewanee, Ill.
Manning & Lewis Engineering Co., Newark, N. J.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
Modine Mfg. Co., Racine, Wis.
National Pipe Bending Co., New Haven, Conn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Perfex Corp., Milwaukee, Wis.
Refrigeration Economics Co., Inc., Canton, O.
Reliable Products Mfg. Co., Brooklyn, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Struthers Wells Corp., Titusville, Pa.
Superior Combustion Industries, Inc., New York, N. Y.
Super Radiator Corp., Minneapolis, Minn.
Taco Heaters, Inc., Cranston, R. I.
Temprite Products Corp., Birmingham, Mich.
Trane Co., The, LaCrosse, Wis.
Tranter Mfg., Inc., Lansing, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Whitlock Mfg. Co., Hartford, Conn.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., New York, N. Y.

COOLERS, UNIT (FLOOR TYPE)

Not air conditioning units, but floor mounted unit with coil and centrifugal fans without filters, for connection to remote compressor or cold water supply. For air conditioning units see Units, Air Conditioning

Acme Industries, Inc., Jackson, Mich.
American Blower Corp., Detroit, Mich.
Bakeraire Corp., South Windham, Me.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Conditionaire Unit Co., Chicago, Ill.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Dole Refrigerating Co., Chicago, Ill.
Drayer-Hanson, Inc., Los Angeles, Calif.
Economy Equipment Co., Chicago, Ill.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Frick Co., Waynesboro, Pa.
Governair Corp., Oklahoma City, Okla.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kauffman Air Conditioning Corp., St. Louis, Mo.
King Co., The, Owatonna, Minn.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Niagara Blower Co., New York, N. Y.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Super-Cold Corp., Los Angeles, Calif.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Yorktowne Machine Co., York, Pa.
Young Radiator Co., Racine, Wis.

COOLERS, UNIT (SUSPENDED TYPE)

Not air conditioning units, but suspended unit with coil and propeller fan, without filters, for connection to remote compressor or cold water supply. For air conditioning units, see Units, Air Conditioning

American Blower Corp., Detroit, Mich.
American Coils Co., Newark, N. J.
American Cooling Tower Co., Kansas City, Mo.
Auburn Burner Co., Auburn, Ind.
Bakeraire Corp., South Windham, Me.
Betz Corp., Hammond, Ind.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Conditionaire Unit Co., Chicago, Ill.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Drayer-Hanson, Inc., Los Angeles, Calif.
Economy Equipment Co., Chicago, Ill.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton, O.
General Machine & Mfg. Co., Berwick, Pa.
Governair Corp., Oklahoma City, Okla.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kauffman Air Conditioning Corp., St. Louis, Mo.
King Co., The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Merchant & Evans Co., Philadelphia, Pa.
Murray Mfg. Co., D. J., Wausau, Wis.
Niagara Blower Co., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Super-Cold Corp., Los Angeles, Calif.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis.
Wilson Engineering Corp., Chicago, Ill.
Wing Mfg. Co., L. J., Linden, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.

COOLING COILS

See Surface, Cooling

COOLING SURFACE

See Surface, Cooling

COOLING TOWERS

See Towers, Cooling

COOLING UNITS

See Units, Air Conditioning; Coolers, Unit

COPPER PIPE

See Pipe, Brass and Copper

COPPER SHEETS

See Sheets, Copper

COPPER TUBE FITTINGS

See Fittings, Copper Tube

COPPER TUBE FITTINGS, FLARED

See Fittings, Copper Tube, Flared

COPPER TUBING

See Tubing, Brass and Copper

CORROSION PREVENTIVES

See Devices, Electrolytic, for Preventing Corrosion; Treatment, Steam System, to Inhibit Corrosion; and Treatment, Water, to Inhibit Corrosion

COUNTERS, DUST

Bausch & Lomb Optical Co., Rochester, N. Y.
Hill & Co., E. Vernon., Lake Geneva, Wis.
Mine Safety Appliances Co., Pittsburgh, Pa.
Service to Industry, West Hartford, Conn.
Willson Products, Inc., Reading, Pa.

COUPLINGS, FLEXIBLE, POWER TRANSMISSION

Ajax Flexible Coupling Co., Westfield, N. Y.
American Flexible Coupling Co., Erie, Pa.
Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich. (Universal joints)

Boston Gear Wks., Quincy, Mass.
Brooks Equipment Corp., Hoboken, N. J.
Browning Mfg. Co., Inc., Maysville, Ky.
Caldwell Co., W. E., Louisville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago, Ill.
Certified Flexible Couplings, New York, N. Y.
Chain Belt Co., Milwaukee, Wis.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Climax Metal Products Co., Cleveland, O.
Congress Drives Div., Tann Corp., Detroit, Mich.
De Laval Steam Turbine Co., Trenton, N. J.
Diamond Chain Co., Inc., Indianapolis, Ind.
Dings Magnetic Separator Co., Milwaukee, Wis.
Dodge Mfg. Corp., Mishawaka, Ind.
Elliott Co., Jeannette, Pa.
Falk Corp., Milwaukee, Wis.
Guardian Products Corp., Michigan City, Ind.
Jeffrey Mfg. Co., Columbus, O.
Jones Foundry & Machine Co., W. A., Chicago, Ill.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Link Belt Co., Chicago, Ill.
Lord Mfg. Co., Erie, Pa.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Medart Co., St. Louis, Mo.
Mercury Clutch Div., Automatic Steel Products, Inc., Canton, O. (automatic centrifugal clutch)
Morse Chain Co., Detroit, Mich.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Piezo Mfg. Corp., New York, N. Y.
Poole Foundry & Machine Co., Baltimore, Md.
Ramsey Chain Co., Inc., Albany, N. Y.
Royersford Foundry & Machine Co., Inc., Royersford, Pa.
Shallcross Co., Philadelphia, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Smith & Serrell, Inc., Newark, N. J.
Thomas Flexible Coupling, Warren, Pa.
Waldron Corp., John, New Brunswick, N. J.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whitney Chain Co., Hartford, Conn.
Wood's Sons Co., T. B., Chambersburg, Pa.

COUPLINGS, PIPE

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Camco Products Inc., North Haven, Conn.
Capitol Mfg. & Supply Co., Columbus, O.
Champion Machine & Forging Co., Cleveland, O.
Chase Brass & Copper Co., Waterbury, Conn.
Clow & Sons, James B., Chicago, Ill.
Continental-Diamond Fibre Co., Newark, Del.
Cooper-Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Drinkwater, Inc., Waukegan, Ill.
Fischer & Porter Co., Hatboro, Pa. (glass)
Flagg & Co., Inc., Stanley G., Philadelphia.
Flodar Corp., Cleveland, O.
Frick Co., Waynesboro, Pa.
Frontier Bronze Corp., Niagara Falls, N. Y.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Harrisburg Steel Corp., Harrisburg, Pa.
Holoal Mfg. Corp., Ridgewood, N. J.
Illinois Malleable Iron Co., Chicago, Ill.
Kennedy Valve Mfg. Co., Elmira, N. Y.
King Union Co., Inc., Hillsgrove, R. I.
Ladish Co., Cudahy, Wis.
Malleable Iron Fittings Co., Branford, Conn.
Marman Products Co., Inc., Los Angeles.
Master Enterprise Corp. of America, Tulsa, Okla.
Morris Coupling & Clamp Co., Ellwood City, Pa.
Mueller Brass Co., Port Huron, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pipeline Development Co., Cleveland, O.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Rhode Island Fittings Co., Providence, R. I.
Star Stainless Screw Co., Paterson, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Stokes Molded Products, Trenton, N. J. (Hard rubber)
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky. (welding couplings)
Union Metal Works, Chelsea, Mass.
United States Gasket Co., Camden, N. J.
U. S. Plug & Fitting Co., Wellington, O.
United States Stoneware Co., New York, N. Y.
Victaulic Co. of America, Elizabeth, N. J.
Vogt Machine Co., Henry, Louisville, Ky.
Wachs Co., E. H., The, Chicago, Ill.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Weatherhead Co., The, Cleveland, O.
Wheatland Tube Co., Philadelphia, Pa.
Wheeling Machine Products Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Youngstown Sheet & Tube Co., Youngstown, O.

COUPLINGS, PIPE, DETACHABLE

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
Cooper Alloy Corp., Hillside, N. J.
Dahl, G. W., Bristol, R. I.
Drinkwater, Inc., Waukegan, Ill.
Gates Engineering Co., Wilmington, Del.
Holoal Mfg. Corp., Ridgewood, N. J.
Morris Coupling & Clamp Co., Ellwood City, Pa.
OPW Corp., Cincinnati, O.
Quik Joint Div., Automatic Bending Co., Harvey, Ill.
Roylyn, Inc., Glendale, Calif.
Smith Bros. Co., Oak Park, Ill.
Snap-Tite, Inc., Union City, Pa.
Victaulic Co. of America, Elizabeth, N. J.
Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.

COVERS, PROTECTIVE, FOR WINDOW AIR CONDITIONERS

Blossom Mfg. Co., Inc., New York, N. Y.
Canvas Products Co., St. Louis, Mo.
International Air Conditioner Cover, New York, N. Y.
Jiffy Covers, Inc., Long Island City, N. Y.
Kelbe-Nolds, Inc., Dallas, Tex.
Wagner Awning & Mfg. Co., Cleveland, O.

CRANE CAB COOLERS

See Coolers, Crane Cab

CUT-OFFS, LOW WATER, HEATING BOILER

Eclipse Fuel Engineering Co., Rockford, Ill.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Johnson Corp., The, Three Rivers, Mich.
Magnetrol Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Newark Controls Co., Bloomfield, N. J.
Schaub Engineering Co., Fred H., Chicago.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

CUTTERS, FLAME FOR PIPING

National Cylinder Gas Co., Chicago, Ill.
Springload Mfg. Corp., Seattle, Wash.
Vernon Tool Co., Ltd., Alhambra, Calif.

CUTTERS, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Atkins Saw Div., Borg-Warner Corp., Indianapolis, Ind.
Barnes Tool Co., The, New Haven, Conn.
Beaver Pipe Tools, Inc., Warren, O. (knife or wheel)
Capewell Mfg. Co., Hartford, Conn.
Clow & Sons, James B., Chicago, Ill.
Continental Machine Co., Chicago, Ill.
Crown Die & Tool Corp., Chicago, Ill.
Erie Tool Works, Erie, Pa.
Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.
Hollands Mfg. Co., Erie, Pa.
Kalamazoo Tank & Silo Co., Machine Tool Div., Kalamazoo, Mich. (metal cutting band saw)
Landis Machine Co., Inc., Waynesboro, Pa.
M-M-A, Inc., Lancaster, Pa.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Cleveland, O.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Saunders Mfg. Co., Yonkers, N. Y.
Springload Mfg. Corp., Seattle, Wash.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass. (hand)
Wachs Co., E. H., The, Chicago, Ill. (pipe saw)

CUTTERS, TUBING

Armstrong Bros. Tool Co., Chicago, Ill.
Bonney Forge & Tool Works, Allentown, Pa.
Capewell Mfg. Co., Hartford, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Continental Machine Co., Chicago, Ill.
Couplings Co., Chicago, Ill.
Duro Metal Products Co., Chicago, Ill.
Everhot Products Co., Chicago, Ill.
Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.
Imperial Brass Mfg. Co., Chicago, Ill.
Landis Machine Co., Inc., Waynesboro, Pa.
Mueller Brass Co., Port Huron, Mich.
Nye Tool Co., Chicago, Ill.
Parker Appliance Co., The, Cleveland, O.
Penn Brass & Copper Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Talon Tools, Inc., North Arlington, N. J.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass. (hand)
Weatherhead Co., Cleveland, O.

DAMPER OPERATORS

See Operators, Damper

DAMPER REGULATORS

See Regulators, Damper Sets

DAMPERS, DIFFUSER

Air Control Products, Inc., Coopersville, Mich.
Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Gallaher Co., The, Omaha, Neb.
Hart & Cooley Mfg. Co., Holland, Mich.
Lima Register Co., Lima, O.
Rittling Corp., The, Buffalo, N. Y.
United States Register Co., Battle Creek, Mich.

DAMPERS, DUCT, MANUALLY OPERATED

Acme Mfg. Co., Holmesburg, Philadelphia, Pa.
Adams Co., The, Dubuque, Ia.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Air Conditioning Engineering Co., Cambridge, Mass.
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Ammerman Co., C. L., Minneapolis, Minn.
Anemostat Corp. of America, New York.
Barnes Co., A. D., Dayton, O.
Controlair Mfg. Co., Los Angeles, Calif.
Corbman Bros., Inc., Philadelphia, Pa.
Elgo Shutter & Mfg. Co., Detroit, Mich.
Excelsior Steel Furnace Co., Chicago, Ill.
General Register Corp., Cedar Grove, N. J.
Hart & Cooley Mfg. Co., Holland, Mich.
Inland Steel Products Co., Milwaukee, Wis.

Jacobs Co., Inc., B. & J., Cincinnati, O.
Johnson Service Co., Milwaukee, Wis.
Kerentoff, G. L., Cincinnati, O.
Martens & Stormoen, West Quincy, Mass.
Minneapolis Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Rittling Corp., The, Buffalo, N. Y.
Sioux Steel Co., Sioux Falls, S. D.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Waterloo Register Co., Inc., Waterloo, Ia.
Williamson Heater Co., Cincinnati, O.
Young Regulator Co., Cleveland, O.

DAMPERS, DUCT, REMOTE CONTROLLED

Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Warming & Ventilating Co., Toledo, O.
Anemostat Corp. of America, New York.
Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Buensod-Stacey, Inc., New York, N. Y.
Combustion Equipment Co., Silvis, Ill.
Controlair Mfg. Co., Los Angeles, Calif.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Reguator Co., Skokie, Ill.
Rittling Corp., The, Buffalo, N. Y.
Shallcross Controls, Inc., Milwaukee, Wis.
Tuttle & Bailey, Inc., New Britain, Conn.
Vapor Heating Corp., Chicago, Ill.
Young Regulator Co., Cleveland, O.

DAMPERS, PULSATION, FOR PIPING SYSTEMS

Campbell Co., J. A., Long Beach, Calif.
Fluor Corp., Ltd., The, Los Angeles, Calif.
Greer Hydraulics, Inc., Brooklyn, N. Y.
Industrial Acoustics Co., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.

DEAERATORS

Acker Organization, Inc., W. M., Meridian, Miss.
American Water Softener Co., Philadelphia.
Belco Industrial Equipment Div., Inc., Paterson, N. J.
Buflovak Equipment Div. of Blaw-Knox Co., Buffalo, N. Y.
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Elgin-Refinite, Div. of Elgin Softener Corp., Elgin, Ill.
Elliott Co., Jeannette, Pa.
General Filter Co., Ames, Ia.
General Heaters & Regulators Co., East Chicago, Ind.
Graham Mfg. Co., Inc., New York, N. Y.
Graver Water Conditioning Co., New York.
Hoppes Mfg. Co., Inc., Springfield, O.
Kewanee-Ross Corp., Kewanee, Ill.
Permutit Co., New York, N. Y.
Schaub Engineering Co., Fred H., Chicago.
Sims Co., Erie, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
Swartwout Co., The, Cleveland, O.
Whitlock Mfg. Co., Hartford, Conn.
Worthington Corp., Harrison, N. J.

DEEP WELL PUMPS

See Pumps, Deep Well

DEHUMIDIFIERS, ABSORPTION AND ADSORPTION

Air Conditioning Engineering Co., Cambridge, Mass.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York, N. Y.
Cargocaire Engineering Corp., New York.
Daly, Merritt & Sullivan, Inc., Falls Church, Va.
Dow Chemical Co., The, Midland, Mich.
Drying Systems, Inc., Chicago, Ill.
Dryomatic Corp., Alexandria, Va.
Floridin Co., Tallahassee, Fla.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Kaufman Co., H. J., Detroit, Mich.
Kemp Mfg. Co., C. M., Baltimore, Md.
Niagara Industrial Corp., New York, N. Y.
Pittsburgh Lectrodryer Corp., Pittsburgh, Pa.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Somers, Inc., H. J., Detroit, Mich.
Surface Combustion Corp., Toledo, O.
Tamms Industries, Inc., Chicago, Ill.

DEHUMIDIFIERS FOR COMPRESSED AIR

Centrifix Corp., Cleveland, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
General Heaters & Regulators Co., East Chicago, Ind.
Kemp Mfg. Co., C. M., Baltimore, Md.
Pittsburgh Lectrodryer Corp., Pittsburgh, Pa.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Selas Corp. of America, Philadelphia, Pa.

DEHUMIDIFIERS, ELECTRIC PLUG-IN, FOR SMALL SPACES

Abbeon Supply Co., Jamaica, N. Y.
Bern's Mfg. Corp., Chicago, Ill.
Blissfield Mfg. Co., Blissfield, Mich.
Cargocaire Engineering Corp., New York, N. Y.
Dryomatic Corp., Alexandria, Va.
Ebco Mfg. Co., Columbus, O.
Fedders-Quigan Corp., Buffalo, N. Y.
Fresh'nd-Aire Company, Div. of Cory Corp., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Haertel Co., Walter, Minneapolis, Minn.
Hotpoint Co., Chicago, Ill.
Hunter Fan & Ventilating Co., Inc., Memphis, Tenn.
Kauffman Air Conditioning Co., St. Louis, Mo.
Kemp Mfg. Co., C. M., Baltimore, Md.
Lonergan Mfg. Co., Albion, Mich.
Mitchell Mfg. Co., Chicago, Ill.
Ohio Foundry & Mfg. Co., Steubenville, O.
Radio Corp. of America, RCA Victor Div., Camden, N. J.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Robbins & Myers, Inc., Fan Div., Memphis, Tenn.
Taylor Co., Halsey W., Warren, O.
Victor Products Corp., Hagerstown, Md.
Walton Laboratories, Inc., Irvington, N. J.
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass.

DEHUMIDIFIERS, SPRAY

See Washers, Air

DEHUMIDIFIERS, SPRAYED COIL

Air & Refrigeration Corp., New York, N. Y.
American Blower Corp., Detroit, Mich.
Blazer, M. & Son, Passaic, N. J.
Carrier Corp., Syracuse, N. Y.
Kennard Corp., St. Louis, Mo.
Marlo Coil Co., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
York Corp., York, Pa.

DEHUMIDIFYING UNITS

See Units, Air Conditioning; Dehumidifiers

DEHYDRANT AND ACID NEUTRALIZER, FOR REFRIGERATING SYSTEMS

Allin Mfg. Co., Chicago, Ill.
Davison Chemical Co., Div. of W. R. Grace & Co., Baltimore, Md.
Highside Chemicals Co., Clifton, N. J.
McIntire Co., The, Newark, N. J.
Mueller Brass Co., Port Huron, Mich.
Remco, Inc., Zelienople, Pa.

DEHYDRATORS, REFRIGERANT

A-P Controls Corp., Milwaukee, Wis.
Aluminum Co. of America, Pittsburgh, Pa.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Eagle Chemical Co., Inc., Chicago, Ill.
Floridin Co., Tallahassee, Fla.
Frigidaire Div., General Motors Corp., Dayton, O.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kenmore Machine Products, Inc., Lyons, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Madden Brass Products Co., Aurora, Ill.
McIntire Co., The, Newark, N. J.
Mueller Brass Co., Port Huron, Mich.
Remco, Inc., Zelienople, Pa.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Shank Co., Cyrus, Chicago, Ill.
Sporlan Valve Co., St. Louis, Mo.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Wabash Corp., Chicago, Ill.

DENSIFIERS, CONCRETE, FOR INCREASING THERMAL CONDUCTIVITY

Products Planning Co., Pittsburgh, Pa.

DESTROYERS, SOOT, CHEMICAL

Allen Co., Robert G., Mechanicsville, N. Y.
Ampion Corp., Long Island City, N. Y.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Coughlan Co., G. N., West Orange, N. J.
Diamond Chemical Products, New York, N. Y.
General Filters, Inc., Novi, Mich.
Healy Ruff Co., St. Paul, Minn.
Hercules Chemical Co., Inc., New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
MacDermid Chemical Co., Bristol, Conn.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., Cleveland, O.
Nutmeg Chemical Co., New Haven, Conn.
O'Brien Industries, Caldwell, N. J.
Perolin Co., Inc., Chicago, Ill.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Saverite Engineering Co., Hoboken, N. J.
Tamms Industries, Inc., Chicago, Ill.
Warren Refining & Chemical Co., The, Cleveland, O.
Western Chemical Co., Kansas City, Mo.

DESUPERHEATERS, STEAM

Babcock & Wilcox Co., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Brown Fintube Co., The, Elyria, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Foster Wheeler Corp., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Springfield Boiler Co., Springfield, Ill.
Swartwout Co., The, Cleveland, O.
Whitlock Mfg. Co., Hartford, Conn.

DETECTORS, LEAK, FUEL OIL

American Gas & Chemicals, Inc., New York, N. Y.
Gates & Co., Inc., George W., Franklin Sq., L. I., N. Y.
Yula Water Heaters, Inc., New York, N. Y.

DETECTORS, LEAK, PIPING

American Gas & Chemicals, Inc., New York.
Universal Controls Corp., Dallas, Tex.

DETECTORS, LEAK, REFRIGERANT

Allin Mfg. Co., Chicago, Ill.
American Gas & Chemicals, Inc., New York, N. Y.
Bernz Co., Otto, Rochester, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Gates & Co., Inc., George W., Franklin Sq., L. I., N. Y.

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Goss Gas, Inc., Pittsburgh, Pa.
Highside Chemicals Co., Clifton, N. J.
Insto-Gas Corp., Detroit, Mich.
Justrite Mfg. Co., Chicago, Ill.
Linde Air Products Co., The, Unit of Union Carbide & Carbon Corp., New York, N. Y.
National Cylinder Gas Co., Chicago, Ill.
Turco Products, Inc., Los Angeles, Calif.
Turner Brass Wks., Sycamore, Ill.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.
Weldit, Inc., Detroit, Mich.

DETECTORS, LEAK, UNDERGROUND PIPING

Fisher Research Laboratory, Inc., Palo Alto, Calif.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Johnson-Williams Ltd., Palo Alto, Calif.
Mine Safety Appliance Co., Pittsburgh, Pa.
Radioactive Products, Inc., Detroit, Mich.
Wilkinson Products Co., Pasadena, Calif.

DEVICES, ELECTROLYTIC, FOR PREVENTING CORROSION

Brown Electro Co., Oklahoma City, Okla.
Cleveland Heater Co., Cleveland, O. (anodic rods)
Electro Rust-Proofing Corp., Belleville, N. J.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Harco Corp., Cleveland, O.
Magnode Products, Inc., Trenton, O.
Maloney Co., F. H., Houston, Tex. (flange insulated couplings)
Marlo Coil Co., St. Louis, Mo.
McRay Products Co., South Pasadena, Calif.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
Rotometals, San Francisco, Calif.
Wallace & Tiernan Co., Inc., Newark, N. J.

DEW POINT INDICATORS

See Indicators, Dew Point

DIAPHRAGM VALVES

See Valves, Diaphragm

DIESEL ENGINES

See Engines, Diesel, for Fan, Pump and Compressor Drives

DIFFUSERS, AIR, BASEBOARD

Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Auer Register Co., Cleveland, O.
Gerwin Industries, Inc., Michigan City, Ind.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Lima Register Co., Lima, O.
Patco Mfg. Co., Philadelphia, Pa.

DIFFUSERS, AIR, CEILING

See also Grilles; Panels, Perforated, for Air Diffusions; Registers

Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Aladdin Heating Corp., San Leandro, Calif.
Anemostat Corp. of America, New York, N. Y.
Ashburn Supply Co., Culver City, Calif.
Barber-Colman Co., Rockford, Ill.
Carnes Corp., Verona, Wis.
Connor Engineering Corp., Danbury, Conn.
Demuth & Sons, Charles, Mineola, L. I., N. Y.
Gallaher Co., The, Omaha, Neb.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Krueger Air Conditioning Co., Tucson, Ariz.
Lima Register Co., The, Lima, O.
Midco Register Corp., St. Paul, Minn.
Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Universal Diffuser Corp., New York, N. Y.

DIFFUSERS, AIR, CEILING WITH COMBINED LIGHTING FIXTURE

Air Devices, Inc., New York, N. Y.
Anemostat Corp. of America, New York.
Barber-Colman Co., Rockford, Ill.
Carnes Co., Verona, Wis.
Connor Engineering Corp., Danbury, Conn.
Universal Diffuser Corp., New York, N. Y.

DIFFUSERS, AIR, FLOOR

A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Lima Register Co., Lima, O.

DIFFUSERS, AIR, HIGH PRESSURE

Anemostat Corp. of America, New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Connor Engineering Corp., Danbury, Conn.
Independent Register Co., Cleveland, O.
Lima Register Co., Lima, O.
Patco Mfg. Co., Philadelphia, Pa.
Titus Mfg. Corp., Waterloo, Iowa
Tuttle & Bailey, Inc., New Britain, Conn.
Universal Diffuser Corp., New York, N. Y.

DIFFUSERS, AIR, WALL

A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Air-Factors, Inc., Monrovia, Calif.
Barber-Colman Co., Rockford, Ill.
Demuth & Sons, Charles, Mineola, L. I., N. Y.
Hart & Cooley Mfg. Co., Holland, Mich.
Independent Register Co., Cleveland, O.
Lima Register Co., Lima, O.
Patco Mfg. Co., Philadelphia, Pa.
Titus Mfg. Corp., Waterloo, Ia.

DIFFUSION, AIR

See Panels, Perforated, for Air Diffusion

DISTRIBUTORS, REFRIGERANT, FOR COOLING COILS

General Controls Co., Glendale, Calif.
Sporlan Valve Co., St. Louis, Mo.

DISTRIBUTORS, WATER, FOR CONDENSERS

Condenser Service & Engineering Co., Inc., Hoboken, N. J.

DOOR CONTROLS

See Controls, Door, Electric Eye

DOORS AND PANELS, ACCESS

Adams Co., The, Dubuque, Ia.
Air-Path Products Co., Baltimore, Md.
Air & Refrigeration Corp., New York, N. Y.
American Foundry & Furnace Co., Bloomington, Ill.
American Metal Works, Inc., New Orleans, La.
Auer Register Co., Cleveland, O.
Biersach & Niedermeyer Co., Milwaukee, Wis.
Camloc Fastener Corp., Paramus, N. J. (Fasteners for)
Clarage Fan Co., Kalamazoo, Mich.
Decatur Iron & Steel Co., Decatur, Ala.
Falstrom Co., Passaic, N. J.
Inland Steel Products Co., Milwaukee, Wis.
International Steel Co., Evansville, Ind.
Kane Mfg. Corp., Kane, Pa.
Kirk & Blum Mfg. Co., Cincinnati, O.
Knapp Bros. Mfg. Co., Inc., Cincinnati, O.
Lumm Co., A. H., Toledo, O.
Technical Ply-Woods, Chicago, Ill.
Walsh Co., L. M., The, Boston, Mass.
Western Wire & Iron Works, Inc., Chicago, Ill. (Metal)
Willis Steel Corp., Galesburg, Ill.

DRAFT CONTROL

See Controls, Draft, Barometric; Regulators, Draft, Combustion

DRAFT GAGES

See Gages, Indicating, Draft

DRAFT RECORDERS

See Recorders, Draft

DRAFT REGULATORS

See Controls, Draft, Barometric; Regulators, Draft, Combustion

DRAINS, TANK, FOR HOT WATER HEATING SYSTEM EXPANSION TANKS

Quality Specialty Co., Inc., Camden, N. J.
Thrush & Co., H. A., Peru, Ind.

DRAWING TEMPLATES, PIPING

See Templates, Drawing, Piping

DRIERS

See Dehydrators, Refrigerant

DRILLS, ELECTRIC AND PNEUMATIC, PORTABLE

Albertson & Co., Inc., Sioux City, Ia.
Anderson & Co., Inc., Sioux City, Ia.
Black & Decker Mfg. Co., Towson, Md.
Buckeye Tools Corp., Dayton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Cincinnati Electrical Tool Co., The, Cincinnati, O.
Clark Electric Co., Jas., Jr., Louisville, Ky.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Dayton Electric Mfg. Co., Chicago, Ill.
Famco Machine Co., Kenosha, Wis.
Ingersoll-Rand Co., New York, N. Y.
Jaco Devices Co., Hingham, Mass.
Joy Mfg. Co., Pittsburgh, Pa.
Keller Tool Co., Grand Haven, Mich.
Lee Co., K. O., Aberdeen, S. D.
Mall Tool Co., Chicago, Ill.
Millers Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Oster Mfg. Co., John, Milwaukee, Wis.
Polis Mfg. Co., J. D., Chicago, Ill.
Porter-Cable Machine Co., Syracuse, N. Y.
Portable Electric Tools, Inc., Chicago, Ill.
Schramm, Inc., West Chester, Pa.
Skil Corp., Chicago, Ill.
Spartan Tool Co., Chicago, Ill.
Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago (Cicero), Ill.
Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Stanley Works, The, New Britain, Conn.
Syntron Co., Homer City, Pa.
Tempo Products Co., Cleveland, O.
Thor Power Tool Co., Aurora, Ill.
U. S. Electrical Tool Co., Cincinnati, O.
Wodack Electric Tool Corp., Chicago, Ill.

DRILLS, MASONRY

Arro Expansion Bolt Co., Marion, O.
Carboloy Dept. of General Electric Co., Detroit, Mich.
Chicago Expansion Bolt Co., Chicago, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Diamond Expansion Bolt Co., Inc., Garwood, N. J.
DoAll Co., The, Des Plaines, Ill.
Paine Co., Addison, Ill.
Rawlplug Co., Inc., The, New York, N. Y.
Schramm, Inc., West Chester, Pa.
Tempo Products Co., Cleveland, O.
Termite Drills, Inc., Pasadena, Calif.
Threadwell Tap & Die Co., Greenfield, Mass.
U. S. Expansion Bolt Co., York, Pa.
Williams & Co., J. H., Buffalo, N. Y.
Wodack Electric Tool Corp., Chicago, Ill.

DRIVES, CHAIN

Boston Gear Works, Quincy, Mass.
Browning Mfg. Co., Inc., Maysville, Ky.
Caldwell Co., W. E., Louisville, Ky.
Chain Belt Co., Milwaukee, Wis.
CraneVeyor Corp., Los Angeles, Calif.
Diamond Chain Co., Inc., Indianapolis, Ind.
Dodge Mfg. Corp., Mishawaka, Ind.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Jeffrey Mfg. Co., Columbus, O.
Link Belt Co., Chicago, Ill.
Medart Co., St. Louis, Mo.
Morse Chain Co., Detroit, Mich.
Ramsey Chain Co., Inc., Albany, N. Y.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Whitney Chain Co., Hartford, Conn.

DRIVES, COOLING TOWER FAN

Cleveland Worm & Gear Co., Cleveland, O.
Doerr Electric Corp., Cedarburg, Wis.
Michigan Tool Co., Detroit, Mich.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Pritchard & Co. of California, J. F. Kansas City, Mo.

DRIVES, FLAT BELT

See also Belting, Leather and Belting, Rubber

American Pulley Co., Philadelphia, Pa.
Baldwin Belting, Inc., New York, N. Y.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Inc., Maysville, Ky.
Caldwell Co., W. E., Louisville, Ky.
Chicago Belting Co., Chicago, Ill.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Goodrich Co., B. F., Akron, O.
Medart Co., St. Louis, Mo.
New York Belting & Packing Co., Passaic, N. J.
Pyott Foundry & Machine Co., Chicago, Ill.
Rhoads & Sons, J. E., Philadelphia, Pa.
Williams & Son, I. B., Dover, N. H.
Wood's Sons Co., T. B., Chambersburg, Pa.

DRIVES, POWER FOR PIPE THREADING

Beaver Pipe Tools, Inc., Warren, O.
Ridge Tool Co., Elyria, O.
Toledo Pipe Threading Machine Co., Toledo, O.

DRIVES, V BELT

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Baldwin Belting, Inc., New York, N. Y.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Browning Mfg. Co., Inc., Maysville, Ky.
Chicago Belting Co., Chicago, Ill.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Congress Drives Div., Tann Corp., Detroit, Mich.
Dayton Rubber Co., Dayton, O.
Dick Co., Inc., R. & J., Passaic, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn.
Gates Rubber Co., The, Denver, Colo.
Goldens' Foundry & Machine Co., Columbus, Ga.
Goodrich Co., B. F., Akron, O.
Jones Foundry & Machine Co., W. A., Chicago, Ill.
Maurey Mfg. Corp., Chicago, Ill.
Medart Co., St. Louis, Mo.
Pyott Foundry & Machine Co., Chicago, Ill.
Reeves Pully Co., Columbus, Ind.
V-Belt Clutch Co., Los Angeles, Calif.
Wayne Manufacturing Co., Pomona, Calif.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J.

DRIVES, VARIABLE SPEED

See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical; Reducers, Speed; Pulleys and Sheaves, for Belt Drives

DRYERS FOR COMPRESSED AIR

See Dehumidifiers for Compressed Air

DRYERS, INDUSTRIAL (COMPARTMENT, TUNNEL CONVEYOR, VACUUM, SPRAY, ROTARY, ETC.)

Air & Refrigeration Corp., New York, N. Y.
Biggs Boiler Works Co., The, E. Akron, O.
Bowen Engineering, Inc., North Branch, N. J.
Buflovak Equipment Div. of Blaw-Knox Co., Buffalo, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Economy Equipment Co., Chicago, Ill.
Instant Drying Corp., New York, N. Y.
Jackson & Church Co., Saginaw, Mich. (Dryer for corn, grain, hops, and wood)
Kirk & Blum Mfg. Co., Cincinnati, O.
Link-Belt Co., Chicago, Ill.
Louisville Drying Machinery Unit, General American Transportation Corp., Louisville, Ky.
Mahr Mfg. Co., Div. of Diamond Iron Wks., Inc., Minneapolis, Minn.
Newcomb-Detroit Co., Detroit, Mich.
Peters-Dalton, Inc., Detroit, Mich.
Proctor & Schwartz, Inc., Philadelphia, Pa.
Raymond Div., Combustion Engineering Inc., Chicago, Ill.
Ross Engineering Corp., J. O., New York, N. Y.
Stokes Machine Co., F. J., Philadelphia, Pa.
Struthers Wells Corp., Titusville, Pa.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Western Precipitation Corp., Los Angeles, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.

DRYERS, REFRIGERANT

See Dehydrators, Refrigerant

DUAL THERMOSTATS

See Thermostats, Two Temperature or Dual

DUCT CONNECTIONS

See Connections, Duct, Flexible; Connectors for Non-Metallic Duct Fabrication

DUCT FURNACES

See Heaters, Duct

DUCT HEATERS

See Heaters, Duct

DUCT INSULATION

See Insulation, Duct

DUCT THERMOSTATS

See Thermostats, Duct Type

DUCT TURNING VANES

See Vanes, Duct Turning, Prefabricated

DUCTS AND DUCT FITTINGS, PREFABRICATED, METALLIC

Acer & Whedon, Inc., Medina, N. Y.
Acme Mfg. Co., Holmesburg, Philadelphia, Pa.
Adelta Mfg. Co., Inc., Philadelphia, Pa.
Ajax Furnace Fitting Co., Div. of Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
American Agile Corp., Bedford, O.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Buckeye Furnace Pipe Co., Columbus, O.
Carrier Corp., Syracuse, N. Y. (spiral conduit for high pressure air distribution)
Champion Furnace Pipe Co., Peoria, Ill.
Char-Gale Mfg. Co., Minneapolis, Minn.
Chicago Furnace Supply Co., Chicago, Ill.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Corbman Bros., Inc., Philadelphia, Pa.
Flexonics Corp., Maywood, Ill.
General Corporation, Minneapolis, Minn.
Gray Metal Products, Inc., Rochester, N. Y.
Heil Process Equipment Corp., Cleveland, O. (lined)
Henry Furnace Co., The, Medina, O.
Howes-Woods Co., Cambridge, Mass.
Inland Steel Products Co., Milwaukee, Wis.
International Heater Co., Utica, N. Y.
Jacobs Co., Inc., B. & J., Cincinnati, O.
Lennox Furnace Co., Columbus, O.
Littleford Bros., Inc., Cincinnati, O.
Lumm Co., A. H., Toledo, O.
Metal Fabricators, Inc., Charlotte, N. C.
Meyer & Bro. Co., F., Peoria, Ill.
Moncrief Furnace Co., Atlanta, Ga.
Mueller Climatrol, Milwaukee, Wis.
Ohio Valley Hardware & Roofing Co., Evansville, Ind.
Robinson Clay Product Co., The, Akron, O.
Schecter Brothers Co., Philadelphia, Pa.
Sioux Steel Co., Sioux Falls, S. D.
Smith-Raymond Co., Columbus, Ga.
United States Register Co., Battle Creek, Mich.
Van Noorden Co., E. Boston, Mass.
Viking Mfg. Corp., Cleveland, O.
Waverly Heating Supply Co., Boston, Mass.
Williamson Heater Co., Cincinnati, O.
York Corp., York, Pa. (Spiral conduit for high pressure air distribution)

DUCTS AND DUCT FITTINGS, PREFABRICATED, NON-METALLIC

American Agile Corp., Bedford, O.
Arrowhead Rubber Co., Long Beach, Calif.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
du Pont de Nemours & Co., E. I., Fabrics & Finishes Dept., Wilmington, Del.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Flexaust Co., New York, N. Y.
Flexible Tubing Corp., Guilford, Conn.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J.
Haveg Corp., Newark, Del. (for fumes)
Heil Process Equipment Corp., Cleveland, O.
Jacobs Co., Inc., B. & J., Cincinnati, O.
Johns-Manville, New York, N. Y.
Knight, Maurice A., Akron, O. (also Permanite)
Lumm Co., A. H., Toledo, O.
Permacrete Products, Columbus, O. (prefabricated concrete forms, also for flooring and roofing)
Sall Mountain Co., Hamilton, O.
Smith-Raymond Co., Columbus, Ga.
Sonoco Products Co., Hartsville, S. C.
United States Rubber Co., New York, N. Y.

DYE PENETRANT

See Penetrant, Dye

DUST COLLECTORS

See Collectors, Dust

DUST COUNTERS

See Counters, Dust

ECONOMIZERS, FUEL

Babcock & Wilcox Co., New York, N. Y.
Combustion Engineering, Inc., New York, N. Y.
Edge Moor Iron Works, Inc., Edge Moor, Del.
Foster Wheeler Corp., New York, N. Y.
Green Fuel Economizer Co., Beacon, N. Y.
Richmond Engineering Co., Inc., Richmond, Va.
Springfield Boiler Co., Springfield, Ill.
Union Iron Works, Erie, Pa.

EJECTORS, SEWAGE

American-Marsh Pumps, Inc., Battle Creek, Mich.
Chicago Pump Co., Chicago, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davidson Co., M. T., New York, N. Y.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Nash Engineering Co., South Norwalk, Conn.
Penberthy Injector Co., Detroit, Mich.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Swaby Mfg. Co., Chicago, Ill.
Weil Pump Co., Chicago, Ill.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Yeomans Bros. Co., Melrose Park, Ill.

ELBOWS, BALANCING, FOR HOT WATER HEATING SYSTEMS

Detroit Controls Corp., Detroit, Mich.
Dunham Co., C. A., Chicago, Ill.
G & H Mfg. Co., Philadelphia, Pa.
Hammond Brass Works, Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kehm Corp., The, Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.

ELECTRIC AIR CLEANERS

See Cleaners, Air, Electrical

ELECTRIC RADIANT HEATING

See Conductors and Panels, Electrical, for Radiant Heating

ELECTRIC DRILLS

See Drills, Electric, Portable

ELECTRIC MOTORS

See Motors, Electric

ELECTRIC PIPE HEATING SYSTEMS

See Systems, Electric Pipe Heating

ELECTRIC SHEARS

See Shears, Electric, Portable

ELECTRIC UNIT HEATERS

See Heaters, Unit, Electric Heating Element

ELECTRIC WATER HEATERS

See Heaters, Water, Electric

ELECTRODES, ARC WELDING

Air Reduction Sales Co., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allegheny Ludlum Steel Corp., Pittsburgh, Pa. (Stainless)
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alloy Rods Co., York, Pa.
American Brass Co., Waterbury, Conn.
American Steel & Wire Div., United States Steel, Cleveland, O.
Arcos Corp., Philadelphia, Pa.
Burdett Oxygen Co. of Calif., Huntington Park, Calif.
Central Steel & Wire Co., Chicago, Ill.
Crucible Steel Co. of America, Pittsburgh, Pa.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Harnischfeger Corp., Milwaukee, Wis.
Hobart Bros. Co., Troy, O.
International Nickel Co., Inc., The, New York, N. Y.
Laclede Steel Co., St. Louis, Mo.
Lincoln Electric Co., Cleveland, O.
Marquette Mfg. Co., Minneapolis, Minn.
Maurath, Inc., Cleveland, O.
McKay Co., Pittsburgh, Pa.
Metal & Thermit Corp., New York, N. Y.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif. (for hard facing)
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National Cylinder Gas Co., Chicago, Ill.
Page Steel & Wire Division of American Chain & Cable Co., Inc., Monessen, Pa.
Sight Feed Generator Co., West Alexandria, O.
Smith Corp., A. O., Milwaukee, Wis.
Trindl Products, Ltd., Chicago, Ill.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.

ELECTRODES, OIL BURNER

Crown Engineer Corp., Keyport, N. J.
Dielectric Products Corp., Inc., Jersey City, N. J.
Isolantite Mfg. Co., Stirling, N. J.

ELIMINATORS, AIR, FOR HEATING AND PIPING SYSTEMS

Anderson Co., V. D., The, Cleveland, O.
Armstrong Machine Works, Three Rivers, Mich.
Bell & Gossett Co., Morton Grove, Ill.
Dole Valve Co., The, Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.
Gorton Heating Corp., Cranford, N. J.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Keeney Mfg. Co., Newington, Conn.
Livingstone Engineering Co., Worcester, Mass.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Moreheat Distribution, Inc., Cincinnati, O.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Multiplex Mfg. Co., Berwick, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
Quality Specialty Co., Inc., Camden, N. J.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Trane Co., The, La Crosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Wright-Austin Co., Detroit, Mich.

ELIMINATORS, SLUG, REFRIGERANT

Blazer, M. & Son, Passaic, N. J.

ENAMELS AND LACQUERS

Acorn Refining Co., Cleveland, O.
American-Marietta Co., Chicago, Ill.
Arco Co., The, Cleveland, O.
Atlas Powder Co., North Chicago, Ill.
Baer Bros., New York, N. Y.
Barreled Sunlight Paint Co., Providence, R. I.
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y. (pipeline and waterworks enamels)
Blue Ridge Talc Co., Inc., Henry, Va.
Claronex Products, Inc., Brooklyn, N. Y.
Cordo Chemical Co., Norwalk, Conn.
Debevoise Co., The, Brooklyn, N. Y.
Devoe & Raynolds Co., Inc., New York.
Dixon Crucible Co., Joseph, Jersey City, N. J.
du Pont de Nemours & Co. (Inc.) E. I., Finishes Div., Wilmington, Del.
Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Heresite & Chemical Co., Manitowoc, Wis. (air dry)
Hilo Varnish Corp., Div. of Carpenter-Morton Co., Everett, Mass.
Horn Co., Inc., A. C., Long Island City, N. Y.
Inter-Coastal Paint Corp., East St. Louis, Ill.
Interchemical Corp., Finishes Div., Newark, N. J.
Irvington Varnish and Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Knight, Maurice A., Akron, O.
Koppers Co., Inc., Pittsburgh, Pa.
Krehbiel Co., J. H., Chicago, Ill.
Mass & Waldstein Co., Newark, N. J.
Master Mechanics Co., Cleveland, O.
Midwest Products Co., Port Byron, Ill.
National Lead Co., New York, N. Y.
O'Brien Corp., The, South Bend, Ind.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Quigley Co., Inc., New York, N. Y.
Reilly Tar & Chemical Corp., Indianapolis, Ind.
Ronor Corp., Cleveland, O. (Spray units)
Rutland Fire Clay Co., Rutland, Vt.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sherwin-Williams Co., The, Cleveland, O.
Sipe & Co., James B., Pittsburgh, Pa.
Sonneborn Sons, Inc., L., New York, N. Y.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Steelcote Mfg. Co., St. Louis, Mo.
Thompson and Co., Oakmont, Pa.
Tropical Paint & Oil Co., Cleveland, O.
Truscon Laboratories, Detroit, Mich.
United Chromium, Inc., New York, N. Y.
Warren Refining & Chemical Co., The, Cleveland, O.
Watson-Standard Co., Pittsburgh, Pa.
Wilbur & Williams Co., Brighton, Mass.
Wilhelm Co., A., Reading, Pa.

ENCLOSURES FOR PERIMETER AIR CONDITIONING SYSTEMS AND AIR CONDITIONING UNITS

Hinrichsen, Inc., A. F., New York, N. Y.
Kauffman Air Conditioning Corp., St. Louis, Mo.
National Sheet Metal Works, New York, N. Y.

ENCLOSURES, RADIATOR

Diamond Mfg. Co., Wyoming, Pa.
Hendrick Mfg. Co., Carbondale, Pa.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Kauffman Air Conditioning Corp., St. Louis, Mo.

ENGINES, DIESEL, FOR FAN, PUMP AND COMPRESSOR DRIVES

American Locomotive Co., Schenectady, N. Y.
Anderson Diesel Engine Co., Philadelphia, Pa.
Baldwin-Lima-Hamilton Corp., Philadelphia, Pa.
Berry-Hill Corp., Hill Diesel Engine Div., Providence, R. I.
Buda Co., Harvey, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Continental Motors Corp., Muskegon, Mich.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Detroit Diesel Engine Div., General Motors Corp., Detroit, Mich.
Fairbanks, Morse & Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Ready-Power Co., The, Detroit, Mich.
Synchro-Start Products, Inc., Skokie, Ill. (automatic controls to start, stop and protect internal combustion engines)
Waukesha Motors Co., Waukesha, Wis.
Witte Engine Works, Oil Well Supply Div., United States Steel Co., Kansas City, Mo.
Worthington Corp., Harrison, N. J.

ENGINES, GAS, FOR FAN, PUMP AND COMPRESSOR DRIVES

Buda Co., Harvey, Ill.
Chicago Pneumatic Tool Co., New York, N. Y.
Continental Motors Corp., Detroit, Mich.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Fairbanks Morse & Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Ready-Power Co., The, Detroit, Mich.
Synchro-Start Products, Inc., Skokie, Ill. (automatic controls to start, stop and protect internal combustion engines)
Waukesha Motor Co., Waukesha, Wis.
Witte Engine Works, Oil Well Supply Div., United States Steel Co., Kansas City, Mo.
Worthington Corp., Harrison, N. J.

ENGINES, STEAM, FOR FAN, PUMP AND COMPRESSOR DRIVES

Skinner Engine Co., Erie, Pa.
Troy Engine & Machine Co., Troy, Pa.
Vilter Mfg. Co., Milwaukee, Wis.
Wachs Co., E. H., The, Chicago, Ill.
Westinghouse Electric Corp., Pittsburgh, Pa.

EQUIPMENT, BALANCING

Balance Engineering Co., Chicago, Ill.
Bear Mfg. Co., Industrial Div., Rock Island, Ill. (dynamic)
Gisholt Machine Co., Madison, Wis.
Olsen Testing Machine Co., Tinius, Willow Grove, Pa.

EVAPORATIVE CONDENSERS

See Condensers, Refrigerating, Evaporative

EVAPORATIVE COOLERS

See Units, Air Conditioning, Summer, Evaporative Cooling Type

EVAPORATORS

See Chillers, Water

EXCHANGERS, HEAT

Acme Industries, Inc., Jackson, Mich.
Adams Co., Inc., R. P., Buffalo, N. Y. (liquid to gas)
Aerco Corp., Northvale, N. J.
Aerofin Corp., Syracuse, N. Y.
Alstrom Corp., New York, N. Y.
Aluminum Co., of America, Pittsburgh, Pa.
American District Steam Co., Inc., North Tonawanda, N. Y.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
Armstrong Co., Richard M., Westchester, Pa.
Bakeraire Corp., Inc., South Windham, Me.
Bell & Gossett Co., Morton Grove, Ill.
Biggs Boiler Wks., Co., The, E. Akron, O.
Binks Mfg. Co., Chicago, Ill.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Cleaver-Brooks Co., Milwaukee, Wis.
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Cochrane Corp., Philadelphia, Pa.
Coen Co., San Francisco, Calif.
Condenser Service & Engineering Co., Inc., Hoboken, N. Y.
Corning Glass Works, Corning, N. Y.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering Inc., Somerville, Mass.
Davis Engineering Corp., Elizabeth, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn.
Drayer-Hanson, Inc., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Duriron Co., The, Dayton, O. (acid resisting)
Eastern Industries, Inc., Hamden, Conn.
Eclipse Fuel Engineering Co., Rockford, Ill.

Edwards Engineering Corp., Pompton Plains, N. J.
Electric Steel Foundry Co., Portland, Ore.
Fedders-Quigan Corp., Buffalo, N. Y.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Fluor Corp., Ltd., The, Los Angeles, Calif.
Foster Wheeler Corp., New York, N. Y.
Frick Co., Waynesboro, Pa.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (Impervious Graphite)
General Fittings Co., Providence, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Gilbert Brass Foundry Co., St. Louis, Mo.
Graham Mfg. Co., Inc., New York, N. Y.
Graver Water Conditioning Co., New York, N. Y.
Griscom-Russell Co., The, Massillon, O.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Heil Process Equipment Corp., Cleveland, O.
Howard Iron Works & Alberger Heater Div., Buffalo, N. Y.
Industrial Filter & Pump Co., Chicago, Ill.
Joy Mfg. Co., Pittsburgh, Pa.
Kaiser Co., E. B., Glenview, Ill.
Kellogg Co., M. W., The, New York, N. Y.
Kenmore Machine Products, Inc., Lyons, N. Y.
Kewanee-Ross Corp., Kewanee, Ill.
Kopperman & Sons, Joseph, Philadelphia, Pa.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lindy Heaters, Inc., New York, N. Y.
Madden Corp., The, Chicago, Ill.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Manning & Lewis Engineering Co., Newark, N. J.
Marley Co., The, Kansas City, Mo.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Mueller Brass Co., Port Huron, Mich.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National Pipe Bending Co., New Haven, Conn.
National Radiator Co., The, Johnstown, Pa.
Niagara Blower Co., New York, N. Y.
Nooter Corp., St. Louis, Mo.
Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill. (roll bonded panels incorporating fluid passages)
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Perfex Corp., Milwaukee, Wis.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Quaid Fabrications, Inc., Philadelphia, Pa.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Reliable Products Mfg. Co., Brooklyn, N. Y.
Richmond Engineering Co., Inc., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Rome-Turney Radiator Co., Rome, N. Y.
Schaub Engineering Co., Fred H., Chicago, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Sims Co., Erie, Pa.
Smith Corp., A. O., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Struthers Wells Corp., Titusville, Pa.
Super Radiator Corp., St. Louis Park, Minneapolis, Minn.
Superior Combustion Industries, Inc., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taco Heaters, Inc., Cranston, R. I.
Techniflex Corp., Port Jervis, N. Y.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Tranter Mfg., Inc., Lansing, Mich.
Union Iron Works, Erie, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
United States Air Conditioning Corp., Minneapolis, Minn.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vapor Heating Corp., Chicago, Ill.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whitlock Mfg. Co., Hartford, Conn.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.
Yula Water Heaters, Inc., New York, N. Y.

EXCHANGERS, HEAT, REFRIGERANT SUCTION LINE

Acme Industries, Inc., Jackson, Mich.
Armstrong Co., Richard M., Westchester, Pa.
Betz Corp., Hammond, Ind.
Brown Fintube Co., The, Elyria, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Dole Refrigerating Co., Chicago, Ill.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Los Angeles, Calif.
Frick Co., Waynesboro, Pa.
Gerstein & Cooper Co., Inc., South Boston, Mass.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Kramer Trenton Co., Trenton, N. J.
Marlo Coil Co., St. Louis, Mo.
Mueller Brass Co., Port Huron, Mich.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Refrigeration Economics Co., Inc., Canton, O.
Super-Cold Corp., Los Angeles, Calif.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Temprite Products Corp., Birmingham, Mich.
Trane Co., The, La Crosse, Wis.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.

EXHAUST HEADS

See Heads, Exhaust, for Pipe Lines

EXHAUST VENTILATION FITTINGS

See Fittings, Exhaust, Garage, for Attaching Car Exhaust Pipe

EXHAUSTERS, WELDING FUME

Aladdin Heating Corp., San Leandro, Calif.
Allington & Curtis Mfg. Co., Saginaw, Mich.
American Blower Corp., Detroit, Mich.
American Machine Products Co., Marshalltown, Ia.
Ammerman Co., C. L., Minneapolis, Minn.
Bertram Co., Harvey P., The, Cincinnati, O.
Black Mfg. Co., Harrison, N. J.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Coppus Engineering Corp., Worcester, Mass.
Dana Fan & Blower Corp., Cincinnati, O.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Gallaher Co., The, Omaha, Neb. & Owatonna, Minn.
General Blower Co., Morton Grove, Ill.
Jenn-Air Products Co., Indianapolis, Ind.
Kirk & Blum Mfg. Co., Cincinnati, O.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
Mine Safety Appliances Co., Pittsburgh, Pa.
Peters-Dalton, Inc., Detroit, Mich.
Ruemelin Mfg. Co., Milwaukee, Wis.
Torit Mfg. Co., St. Paul, Minn.
Utility Fan Corp., Los Angeles, Calif.
Wing Mfg. Co., L. J., Linden, N. J.
Wind-Way Fan & Ventilator Co., New Orleans, La.

EXPANDERS, TUBE

Chicago Pneumatic Tool Co., New York, N. Y.
Crane Packing Co., Chicago, Ill.
Key Co., East St. Louis, Ill.
Talon Tools, Inc., North Arlington, N. J.
Vernon Tool Co., Ltd., Alhambra, Calif.
Wilson, Inc., Thomas C., Long Island City, N. Y.

EXPANSION BENDS

See Bends, Expansion

EXPANSION BOLTS

See Bolts, Expansion

EXPANSION JOINTS

See Joints, Pipe Expansion

EXPANSION TANKS

See Tanks, Expansion, for Hot Water Heating Systems

EXPANSION VALVES

See Valves, Refrigeration

EXTENSIONS, FURNACE, WATER WALL, FOR BOILERS

Crotty Mfg. Corp., Flushing, L. I., N. Y.
Henriksen Co., C. O., Chicago, Ill.

EXTRACTORS, PIPE

Chicago Specialty Mfg. Co., Chicago, Ill.
Greenfield Tap & Die Corp., Greenfield, Mass.
Reps Tool Co., Inc., Hartford, Conn.
Ridge Tool Co., Elyria, O.
Roddick Tool Co., Anaheim, Calif.
Walton Co., Hartford, Conn.

FABRICATED PIPING

See Bends; Headers; etc.

FABRICATORS, PIPE

See Headers, Pipe, Welded; and Coils, Pipe

FAN BALANCING EQUIPMENT

See Equipment, Balancing

FAN BASES

See Bases and Pads, Vibration Isolating

FAN BLADES

See Blades, Propeller Fan

FAN HOUSINGS

See Housings, Fan, Centrifugal

FANS, AXIAL FLOW, PRESSURE TYPE

Aerovent Fan Co., Inc., Piqua, O. (Tubeaxial and vanexial)
American Blower Corp., Detroit, Mich.
Bahnson Co., Winston-Salem, N. C. (Vaneaxial)
Bertram Co., Harvey P., The, Cincinnati, O.
Buffalo Forge Co., Buffalo, N. Y.
Chicago Blower Corp., Franklin Park, Ill. (tubeaxial)
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Dynamic Air Engineering, Inc., Los Angeles, Calif.
Eastern Air Devices, Inc., Dover, N. H. (tubeaxial and vaneaxial)
General Blower Co., Morton Grove, Ill.
Hartzell Propeller Fan Co., Piqua, O.
Ilg Electric Ventilating Co., Chicago, Ill.
International Engineering Inc., Dayton, O.
Joy Mfg. Co., Pittsburgh, Pa. (vaneaxial)
Kody Blower Co., Trenton, N. J. (tubeaxial)
M & E Mfg. Co., Indianapolis, Ind.
Moore Co., The, St. Louis, Mo. (tubeaxial and vaneaxial)
Propellair Div., Robbins & Myers Inc., Springfield, O.
Robinson Ventilating Co., Zelionople, Pa.
South Bend Air Products, Inc., South Bend, Ind.
Stanat Mfg. Co., Long Island City, N. Y. (vaneaxial—2 to 6 in diameter)
Trade-Wind Motorfans, Inc., Rivera, Calif.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

FANS, CENTRIFUGAL

Advance Aluminum Castings Corp., Chicago, Ill.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Airwasher Corp., Eaton Rapids, Mich.
Aladdin Heating Corp., San Leandro, Calif.
Allington & Curtis Mfg. Co., Saginaw, Mich.
American Agile Corp., Bedford, O.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Foundry & Furnace Co., Bloomington, Ill.
American Machine Products Co., Marshalltown, Ia.
Ammerman Co., C. L., Minneapolis, Minn.
Bayley Blower Co., Milwaukee, Wis.

Bern's Mfg. Co., Chicago, Ill.
Bishop & Babcock Mfg. Co., Cleveland, O.
Blower Application Co., Milwaukee, Wis.
Brookside Products Co., Inc., McCordsville, Ind.
Brundage Co., The, Kalamazoo, Mich.
Buffalo Forge Co., Buffalo, N. Y.
Burdett Mfg. Co., Chicago, Ill.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Carolina Blower Co., Inc., Greensboro, N. C.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Cook Co., Loren, Berea, O.
Coppus Engineering Corp., Worcester, Mass.
Day Co., The, Minneapolis, Minn.
Dayton Electric Mfg. Co., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Eastern Air Devices, Inc., Dover, N. H.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Ft. Worth Steel & Machinery Co., Ft. Worth, Tex.
Frigid, Inc., Brooklyn, N. Y.
Gallaher Co., The, Omaha, Neb.
Garden City Fan Co., Chicago, Ill.
General Blower Co., Morton Grove, Ill.
General Blower Co., Inc., Philadelphia, Pa.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (ceramics)
General Heating Products Co., Philadelphia.
Green Fuel Economizer Co., Beacon, N. Y.
Hartzell Propeller Fan Co., Piqua, O.
Hastings Air Conditioning Co., Hastings, Neb.
Ilg Electric Ventilating Co., Chicago, Ill.
Indiana Fan Company, Indianapolis, Ind.
International Sales Co., San Francisco, Calif.
Jackson & Church Co., Saginaw, Mich.
Jaden Mfg. Co., Hastings, Neb.
Jamieson Mfg. Co., Dallas, Tex.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
King Co., The, Owatonna, Minn.
Lau Blower Co., Dayton, O.
Lehigh Fan & Blower Co., Allentown, Pa.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mahr Mfg. Co., Div. of Diamond Iron Wks., Inc., Minneapolis, Minn.
Martin Fan & Blower Co., Chicago, Ill.
Montag Stove & Furnace Wks., Portland, Ore.
Morrison Products Inc., Cleveland, O.
Motionair Co., Los Angeles, Calif.
Mountain States Equipment Co., Denver, Colo.
Mueller Climatrol, Milwaukee, Wis.
National Engineering & Mfg. Co., Sedalia, Mo.
New York Blower Co., Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Niagara Blower Co., New York, N. Y.
Northern Blower Co., Cleveland, O.
Palmer Mfg. Co., Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Phelps Mfg. Co., Little Rock, Ark.
Power Engineering Co., Chicago, Ill.
Prat-Daniel Corp., South Norwalk, Conn.
Reynolds Mfg. Co., The, Comstock Park, Mich.
Redmond Co., Inc., Owosso, Mich.
Revcor, Carpentersville, Ill.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Robinson Ventilating Co., Zelionople, Pa.
St. Louis Blow Pipe & Heater Co., Inc., St. Louis, Mo.
Schwitzer-Cummins Co., Indianapolis, Ind.
Small Motors, Inc., Chicago, Ill. (small sizes)
Standard Electric Mfg. Co., West Berlin,, N. J.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Trade-Wind Motorfans, Inc., Rivera, Calif.
Trane Co., The, LaCrosse, Wis.
Triangle Mfg. Co., Oshkosh, Wis.
United Electric Service Co., Wichita Falls, Tex.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Viking Air Conditioning Div., The National Radiator Co., Cleveland, O.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Whitty Co., Inc., Boston, Mass.

FANS, INDUCED DRAFT, FOR BOILERS

Bertram Co., Harvey P., The, Cincinnati, O.
Bressler Engineering Service, Oregon, Ill.
Brookside Products Co., Inc., McCordsville, Ind.
Century Fan & Ventilator Co., Stamford, Conn.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Gallaher Co., The, Omaha, Neb.
Garden City Fan Co., Chicago, Ill.
General Blower Co., Morton Grove, Ill.
General Blower Co., Inc., Philadelphia, Pa.
Green Fuel Economizer Co., Beacon, N. Y.
International Engineering, Inc., Dayton, O.
Lehigh Fan & Blower Co., Allentown, Pa.
Quickdraft Co., Div. of Hall Safe Co., Inc., Canton, O.
Robinson Ventilating Co., Zelionople, Pa.
Tjernlund Mfg. Co., St. Paul, Minn.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Whitty Co., Inc., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

FANS, PROPELLER

Acme Equipment Co., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Air Equipment Co., Chicago, Ill.
Aire-Foile Fan & Blower Co., Detroit, Mich.
Airmaster Corp., Chicago, Ill.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Coolair Corp., Jacksonville, Fla.
Baldor Electric Co., St. Louis, Mo.
Bar-Brook Mfg. Co., Inc., Shreveport, La.
Belco Industries, Inc., St. Louis, Mo.
Bern's Mfg. Co., Chicago, Ill.
Bertram Co., Harvey P., The, Cincinnati, O.
Bishop & Babcock Mfg. Co., Cleveland, O.
Broan Mfg. Co., Inc., Milwaukee, Wis.
Brookside Products Co., Inc., McCordsville, Ind.
Bronson Fan Mfg. Corp., Los Angeles, Calif.
Buffalo Forge Co., Buffalo, N. Y.
Burden Co., Alan E., Los Angeles, Calif.
C & H Air Conditioning Fan Co., Inc., Atlanta, Ga.
Carling Turbine Blower Co., Worcester, Mass.
Carey Mfg. Co., Philip, Cincinnati, O.
Century Fan & Ventilator Co., Stamford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. Y.
Chicago Blower Corp., Franklin Park, Ill.
Clarage Fan Co., Kalamazoo, Mich.
Climax Machinery Co., Indianapolis, Ind.
Commercialaire, Inc., Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
Coppus Engineering Corp., Worcester, Mass.
Dana Fan & Blower Corp., Cincinnati, O.
Dayton Electric Mfg. Co., Chicago, Ill.
De Bothezat Fans Div., American Machine & Metals, Inc., New York, N. Y.
DeVilbiss Co., The, Toledo, O.
Diehl Mfg. Co., Somerville, N. J.
Dual-Air Fan Co., South Elgin, Ill.
Dynamic Air Engineering, Inc., Los Angeles.
Eastern Air Devices, Inc., Dover, N. H.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fasco Industries, Inc., Rochester, N. Y.
Frigid, Inc., Brooklyn, N. Y.
Gallaher Co., The, Omaha, Nebr.
General Blower Co., Morton Grove, Ill.
Guth Co., Edwin F., St. Louis, Mo.
Hartzell Propeller Fan Co., Piqua, O.
Holden Fan Co., Detroit, Mich.
Hunter Fan & Ventilating Co., Inc., Memphis, Tenn.
Ilg Electric Ventilating Co., Chicago, Ill.
Indiana Fan Co., Indianapolis, Ind.
International Engineering, Inc., Dayton, O.
Jamieson Mfg. Co., Dallas, Tex.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Kernchen Co., Chicago, Ill.
King Co., The, Owatonna, Minn.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Kody Blower Co., Trenton, N. J.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Lau Blower Co., Dayton, O.
Lonergan Mfg. Co., Albion, Mich.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
McLarty Systems, Battle Creek, Mich.
Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Moore Co., The, St. Louis, Mo.
Motionair Co., Los Angeles, Calif.
Mountain States Equipment Co., Denver.
Muckle Mfg. Co., Owatonna, Minn.
Murray Co. of Texas, The, Atlanta, Ga.
Myers Electric Co., Inc., Pittsburgh, Pa.
National Engineering & Mfg. Co., Sedalia, Mo.
National Gas Equipment Co., Inc., Denison, Tex.
New York Blower Co., Chicago, Ill.
Peerless Electric Co., Warren, O. (Disc)
Perkins & Son, Inc., B. F., Holyoke, Mass.
Phelps Mfg. Co., Little Rock, Ark.
Pritchard & Co. of California, J. F., Kansas City, Mo.
Propellair Div., Robbins & Myers, Inc., Springfield, O.
Reed Unit-Fans, Inc., New Orleans, La.
Reynolds Electric Co., River Grove, Ill.
Rich Fan Mfg. Co., Inc., Phil, Houston, Texas
Robbins & Myers, Inc., Fan Div., Memphis, Tenn.
Robinson Ventilating Co., Zelionople, Pa.
St. Louis Blow Pipe & Heater Co., Inc., St. Louis, Mo.
Schwitzer-Cummins Co., Indianapolis, Ind.
Signal Electric Div. of King-Seeley Corp., Menominee, Mich.
Somers, Inc., H. J., Detroit, Mich.
South Bend Air Products, Inc., South Bend, Ind.
Standard Electric Mfg. Co., West Berlin, N. J.
Sutton Corp., O. A., The, Wichita, Kan.
Swift Mfg. Co., Inc., Hazel Park, Mich.
Thermal Industries, Indio, Calif.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Trade-Wind Motorfans, Inc., Rivera, Calif.
Trane Co., The, LaCrosse, Wis.
Truflow Fan Co., Harmony, Pa.
United Electric Service Co., Wichita Falls, Tex.
United States Air Conditioning Corp., Minneapolis, Minn.
Universal Industrial Propeller Co., Stamford, Conn.
Western Blower Co., Seattle, Wash.
Western Engineering & Mfg. Co., Venice, Calif.
Wind-Way Fan & Ventilating Co., New Orleans, La.
Wing Mfg. Co., L. J., Linden, N. J.

FASTENERS, INSULATION

Acme Steel Co., Chicago, Ill (steel strapping)
Devices, Inc., New York, N. Y.
Gerrard & Co., A. J., Melrose Park, Ill.
Lexsuco, Inc., Cleveland, O.
Moore, Inc., Goodloe, E., Danville, Ill.
Miracle Adhesives Corp., New York, N. Y.
Nelson Stud Welding Div., Gregory Industries Inc., Lorain, O.
Presstite Engineering Co., St. Louis, Mo.
Ramset Div., Olin Mathieson Chemical Corp., Cleveland, O. (powder-actuated)
Stic-Klip Mfg. Co., Inc., Cambridge, Mass.
Tinnerman Products, Inc., Cleveland, O.

FASTENERS, POWDER OPERATED

Powder Power Tool Corp., Portland, Ore.
Ramset Div., Olin Mathieson Chemical Corp., Cleveland, O.
Remington Arms Co., Inc., Bridgeport, Conn.
Tempo Products Co., Cleveland, O.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.

FEEDERS, CHEMICAL, PROPORTIONING

American Water Softener Co., Philadelphia, Pa.
Belco Industrial Equipment Div., Inc., Paterson, N. J.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Bogue Electric Co., Paterson, N. J.
Cochrane Corp., Philadelphia, Pa.
Dearborn Chemical Co., Chicago, Ill.
Elgin Softener Corp., Elgin, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fuller Co., Catasauqua, Pa.
Graver Water Conditioning Co., New York, N. Y.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hungerford & Terry, Inc., Clayton, N. J.
Jeffrey Mfg. Co., Columbus, O.
Madden & Co., P. E., Chicago, Ill.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Myers & Bros. Co., F. E., The, Ashland, O.
Omega Machine Co., Div., of B-I-F Industries, Inc., Providence, R. I. (liquid and dry)
Paddock Engineering Co. of Texas, Dallas, Tex.
Permutit Co., New York, N. Y.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Precision Chemical Pump Corp., Waltham, Mass.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Syntron Co., Homer City, Pa.
Wallace & Tiernan Co., Inc., Newark, N. J.

FEEDERS, WATER, HEATING BOILER

Acker Organization, Inc., W. M., Meridian, Miss.
Bailey Co., Chas. M., San Francisco, Calif.
Campbell Co., J. A., Long Beach, Calif.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Davis Regulator Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Kieley & Mueller, Inc., Middletown, N. Y.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Magnetrol, Inc., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Morehead Mfg. Co., Detroit, Mich.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Nason Co., Clarkston, Mich.
Newark Controls Co., Bloomfield, N. J.
Penn Controls, Inc., Goshen, Ind.
Schaub Engineering Co., Fred H., Chicago, Ill.
Squires Co., C. E., The, Cleveland, O.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

FEEDWATER HEATERS

See Deaerators

FIBER PACKING

See Packing, Fiber

FIBER PIPE

See Pipe, Fiber

FILTER GAGES

See Gages, Air Filter

FILTERS, AIR, AUTOMATIC

Air-Maze Corp., Cleveland, O.
Air-Stream Filter Corp., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
Bahnson Co., Winston-Salem, N. C.
Continental Air Filters, Inc., Louisville, Ky.
Dollinger Corp., Rochester, N. Y.
Farr Co., Los Angeles, Calif.
Leavitt Machine Co., Orange, Mass.
Ruemelin Mfg. Co., Milwaukee, Wis.

FILTERS, AIR, ELECTRIC

See Cleaners, Air, Electrical

FILTERS, AIR, GREASE

Air Devices, Inc., New York, N. Y.
Air Filter Corp., Milwaukee, Wis.
Air-Maze Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
Continental Air Filters, Inc., Louisville, Ky.
Cuno Engineering Co., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Evans Corp., The, George, Moline, Ill.
Farr Co., Los Angeles, Calif.
Filtair Mfg. Co., San Francisco, Calif.
Research Products Corp., Madison, Wis.
Smith Filter Corp., Moline, Ill.

FILTERS, AIR, UNIT, CLEANABLE

Air Devices, Inc., New York, N. Y.
Air Filter Corp., Milwaukee, Wis.
Air-Maze Corp., Cleveland, O.
Air-Stream Filter Corp., St. Louis, Mo.
Aluminum Wool Div., Carey Electronic Engineering Co., Springfield, O.
American Air Filter Co., Inc., Louisville, Ky.
Annis Air Filter Div., Royal Heaters, Inc., Alhambra, Calif.
Bard Mfg. Co., Bryan, O.
Carey Electronic Engineering Co., Metal Wool Div., Springfield, O.
Continental Air Filters, Inc., Louisville, Ky.
Coppus Engineering Corp., Worcester, Mass.
Dollinger Corp., Rochester, N. Y.
Evans Corp., The, George, Moline, Ill.
Farr Co., Los Angeles, Calif.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Research Products Corp., Madison, Wis.
Somers, Inc., H. J., Detroit, Mich.
Smith Filter Corp., Moline, Ill.
Stoddard Industries, Inc., Chicago, Ill.

FILTERS, AIR, UNIT, ELECTROSTATIC, SELF-CHARGING

Besser Metal Products Corp., Charlotte, N. C.
Electro-Air Cleaner Co., Los Angeles, Calif.
Goodyear Tire & Rubber Co., Akron, O.
Microtron Corp., Charlotte, N. C.
Stoddard Industries, Inc., Chicago, Ill.

FILTERS, AIR, UNIT, RENEWABLE MEDIA

Air-Maze Corp., Cleveland, O.
American Air Filter Co., Inc., Louisville, Ky.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Annis Air Filter Div., Royal Heaters, Inc., Alhambra, Calif.
Cambridge Filter Corp., Syracuse, N. Y.
Continental Air Filters, Inc., Louisville, Ky.
Cuno Engineering Co., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Filtrex Corp., Corona, Long Island, N. Y.
Himelblau Associates, Inc., Chicago, Ill.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Research Products Corp., Madison, Wis.

FILTERS, AIR, UNIT, THROW-AWAY

Airgard Mfg. Co., Chicago, Ill.
American Air Filter Co., Inc., Louisville, Ky.
Bowman Co., D. F., New Albany, Ind. (Special sizes)
Cambridge Filter Corp., Syracuse, N. Y. (absolute filters)
Cuno Engineering Co., Meriden, Conn.
Drico Industrial Corp., New York, N. Y.
Filtrex Corp., Corona, L. I., N. Y.
Flanders Mill, Inc., Riverhead, Long Island, N. Y.
Himelblau Associates, Inc., Chicago, Ill.
Mine Safety Appliances Co., Pittsburgh, Pa.
Owens-Corning Fiberglas Corp., Toledo, O.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Research Products Corp., Madison, Wis.
Wilson & Co., Inc., Chicago, Ill.

FILTERS FOR OIL BURNERS

A-P Controls Corp., Milwaukee, Wis.
Andale Co., Philadelphia, Pa.
Barclay, Inc., Robert, Chicago, Ill.
Commercial Filters Corp., Melrose, Mass.
Cuno Engineering Corp., Meriden, Conn.
Eddington Metal Specialty Co., Eddington, Pa.
Fano-Flame Oil Burner Corp., Huntington Park, Calif.
Fram Corp., Providence, R. I.
General Filters, Inc., Novi, Mich.
Hauck Mfg. Co., Brooklyn, N. Y.
Marquart Mfg. Co., Oakland, Calif.
Marvel Engineering Co., Chicago, Ill.
Meldon Industries Div., Tool Industries, Inc., Detroit, Mich.
Morse-Smith-Morse Co., The, Watertown, Mass.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Purolator Products, Inc., Rahway, N. J.
Rega Mfg. Co., Rochester, N. Y.
Sparkler Mfg. Co., Mundelein, Ill.
Unifilter Co., Farmington, Mich.
W. G. B. Oil Clarifier, Inc., Kingston, N. Y.
Webster Electric Co., Racine, Wis.

FILTERS, ODOR

See Adsorbers, Odor

FILTERS, PIPE LINE

Adams Co., Inc., R. P., Buffalo, N. Y.
Air Conversion Research Corp., Chicago, Ill.
Airlenco, Inc., Mansfield, Ohio.
Air-Maze Corp., Cleveland, Ohio.
Alco Valve Co., St. Louis, Mo.
American Air Filter Co., Inc., Louisville, Ky.
American Cyanamid & Chemical Corp., New York, N. Y.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
Andale Co., Philadelphia, Pa.
Anderson Co., V. D., The, Cleveland, O.
Bowser, Inc., Fort Wayne, Ind.
CCA Products, Inc., Glendale, Calif.
Champion Laboratories, Inc., Meriden, Conn.
Cleveland Humidifier Co., Cleveland, O.
Commercial Filters Corp., Melrose, Mass.
Conoflow Corp., Philadelphia, Pa.
Cuno Engineering Corp., Meriden, Conn.
DeVilbiss Co., The, Toledo, O.
Dollinger Corp., Rochester, N. Y.
Eddington Metal Specialty Co., Eddington, Pa.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Fisher Governor Co., Marshalltown, Ia.
Fram Corp., Providence, R. I.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Filters, Inc., Novi, Mich.
Johnson Corp., The, Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
Kraissl Co., Inc., The, Hackensack, N. J.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Marvel Engineering Co., Chicago, Ill.
Micro Metallic Corp., Glen Cove, N. Y.
Moraine Products Div., General Motors Corp., Dayton, O. (Porous metal)
Newark Wire Cloth Co., Newark, N. J.
Norgren Co., C. A., Englewood, Colo.
Norwalk Valve Co., South Norwalk, Conn.
Patrol Valve Co., The, Cleveland, O.
Porous Plastic Filter Co., Glen Cove, N. Y.
Scientific Instrument Co., Detroit, Mich.
Selas Corp., of America, Philadelphia, Pa.
Standard Machine & Mfg. Co., St. Louis, Mo.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Trerice Co., Detroit, Mich.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Winslow Engineering Co., Oakland, Calif.
Worthington Corp., Harrison, N. J.

FILTERS, REFRIGERANT

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
Commercial Filters Corp., Melrose, Mass.
Dollinger Corp., Rochester, N. Y.
Eddington Metal Specialty Co., Eddington, Pa.
General Filter Co., Ames, Ia.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kenmore Machine Products, Inc., Lyons, N. Y.
McIntire Co., The, Newark, N. J.
Moraine Products Div., General Motors Corp., Dayton, O. (Porous metal)
Mueller Brass Co., Port Huron, Mich.
Newark Wire Cloth Co., Newark, N. J.
Phillips & Co., H. A., Chicago, Ill.
Porous Plastic Filter Co., Glen Cove, N. Y.

Remco, Inc., Zelienople, Pa.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Standard Machine & Mfg. Co., St. Louis, Mo.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.

FILTERS, WATER

Adams Co., Inc., R. P., Buffalo, N. Y.
Alco Valve Co., St. Louis, Mo.
American Cyanamid & Chemical Corp., New York, N. Y.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Andale Co., Philadelphia, Pa.
Austin Engineering & Mfg. Co., Inc., Ysleta (El Paso County) Texas
Belco Industrial Equipment Div., Inc., Paterson, N. J.
Bowser, Inc., Fort Wayne, Ind.
Bruner Corp., Milwaukee, Wis.
Chemical Engineering Co., Dallas, Tex.
Cochrane Corp., Philadelphia, Pa.
Commercial Filters Corp., Melrose, Mass.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Cuno Engineering Corp., Meriden, Conn.
Dollinger Corp., Rochester, N. Y.
Duro Co., Dayton, O.
Eddington Metal Specialty Co., Eddington, Pa.
Elgin-Refinite, Div. of Elgin Softener Corp., Elgin, Ill.
Elgin Softener Corp., Elgin, Ill.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Fram Corp., Providence, R. I.
Graver Water Conditioning Co., New York, N. Y.
Greer Hydraulics, Inc., Brooklyn, N. Y.
Henry Valve Co., Melrose Park, Ill.
Hungerford & Terry, Inc., Clayton, N. J.
Industrial Filter & Pump Co., Chicago, Ill.
Kaye & MacDonald, Inc., West Orange, N. J.
Marvel Engineering Co., Chicago, Ill.
Micro Metallic Corp., Glen Cove, N. Y.
Newark Wire Cloth Co., Newark, N. J.
Norwood Associated Engineers Inc., Springfield, Mass.
Permutit Co., New York, N. Y.
Porous Plastic Filter Co., Glen Cove, N. Y.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Research Products Corp., Madison, Wis.
Reynolds Shaffer Co., Detroit, Mich.
Sparkler Mfg. Co., Mundelein, Ill.
Stover Water Softener Co., St. Charles, Ill.
Uniflow Mfg. Co., Erie, Pa.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Winslow Engineering Co., Oakland, Calif.
Worthington Corp., Harrison, N. J.

FINNED TUBING

See Tubing, Finned

FIRE EXTINGUISHING SYSTEMS

See Systems, Fire Extinguishing

FIRE PUMPS

See Pumps, Fire

FITTINGS, ALUMINUM TUBE

Crawford Fitting Co., Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Parker Appliance Co., Cleveland, O.

FITTINGS, BLOW PIPE

Ajax Furnace Fitting Co., Div. of Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
Allington & Curtis Mfg. Co., Saginaw, Mich.
American Blow Pipe Co., Chicago, Ill. (pipe, elbows, etc.)
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
Carolina Blower Co., Inc., Greensboro, N. C.
Chicago Metal Mfg. Co., Chicago, Ill.
Day Co., The, Minneapolis, Minn.
Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.
Griffin & Co., Louisville, Ky.
Indiana Fan Co., Indianapolis, Ind.
Kirk & Blum Mfg. Co., Cincinnati, O.
National Metal Fabricators, Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Northern Blower Co., Cleveland, O.
Peters-Dalton, Inc., Detroit, Mich.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Research Vacuum Supply Co., Chicago, Ill.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Schmieg Industries, Detroit, Mich.
Tiffin Eaves Trough Clamp Co., Tiffin, O.
Torit Mfg. Co., St. Paul, Minn.
United States Register Co., Battle Creek, Mich.
Winkler & Sons, Inc., A. E., Milwaukee, Wis.
Young & Bertke Co., Cincinnati, O.

FITTINGS AND BUSHINGS, FUEL OIL TANK

Flagg & Co., Inc., Stanley G., Philadelphia.
Mel-Gauge Co., New Haven, Conn.
Universal Valve Co., Elizabeth, N. J.
U. S. Plug & Fitting Co., Wellington, O.
Ward Foundries, Inc., J. P., Blossburgh, Pa.

FITTINGS FOR CENTRAL VACUUM CLEANING SYSTEMS

H-P Products, Inc., Louisville, O.
Spencer Turbine Co., Hartford, Conn.

FITTINGS, COPPER TUBE, COMPRESSION

Acheson Mfg. Co., Rankin, Pa.
Aircraft Fittings Co., Cleveland, O.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Forging and Mfg. Co., Chicago, Ill.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Everhot Products Co., Chicago, Ill.
Hays Mfg. Co., Erie, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Lunkenheimer Co., Cincinnati, O.
Madden Brass Products Co., Aurora, Ill.
Oil Equipment Mfg. Corp., New Haven, Conn.
Parker Appliance Co., The, Cleveland, O.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Wabash Corp., Chicago, Ill.
Weatherhead Co., Cleveland, O.

FITTINGS, COPPER TUBE, FLARED

Acheson Mfg. Co., Rankin, Pa.
Aircraft Fitting Co., Cleveland, O.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., Chicago, Ill.
Everhot Products Co., Chicago, Ill.
Gardiner Metal Co., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Hays Mfg. Co., Erie, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Madden Brass Products Co., Aurora, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Oil Equipment Mfg. Corp., New Haven, Conn.
Parker Appliance Co., The, Cleveland, O.
Phoenix Brass Fittings Corp., Irvington, N. J.
Remco, Inc., Zelienople, Pa.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Truetite Corp., The, Bridgeport, Conn.
Union Malleable Mfg. Co., Ashland, O.
Wabash Corp., Chicago, Ill.
Weatherhead Co., Cleveland, O.

FITTINGS, COPPER TUBE, SOLDER

Acheson Mfg. Co., Rankin, Pa.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Gardiner Metal Co., Chicago, Ill.
General Fittings Co., Providence, R. I.
Grabler Mfg. Co., Cleveland, O.
Hammond Brass Works, Hammond, Ind.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y. (Brazed)

FITTINGS, DRAINAGE, FIXED AIR BREAK

Beaton & Cadwell Mfg. Co., New Britain, Conn.
Crane Co., Chicago, Ill.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.

FITTINGS, EXHAUST, GARAGE, FOR ATTACHING CAR EXHAUST PIPE

Ammerman Co., C. L., Minneapolis, Minn.
Kent-Moore Organization, Inc., Detroit, Mich.
Wendt Co., O. A., Chicago, Ill.

FITTINGS, HOSE TO PIPE

Acheson Mfg. Co., Rankin, Pa.
Allen Mfg. Co., W. D., Chicago, Ill.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dole Refrigerating Co., Chicago, Ill.
Goodall Rubber Co., Trenton, N. J.
Hewitt-Robins, Inc., Hewitt Rubber Div., Buffalo, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Weatherhead Co., The, Cleveland, O.

FITTINGS, HOT WATER HEATING SYSTEMS, ONE PIPE

American Tube Products, Inc., Natick, R. I.
Autostributor Co., Lansing, Mich. (manifold for connecting radiator branches)
Bell & Gossett Co., Morton Grove, Ill.
Dunham Co., C. A., Chicago, Ill.
General Heaters & Regulators Co., East Chicago, Ind.
Hi-Flow Products, Inc., Lindenhurst, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kehm Corp., The, Chicago, Ill.
Mel Products Co., The, New Haven, Conn.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sullivan Valve & Engineering Co., Butte, Mont.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.

FITTINGS, LIFT

Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

FITTINGS, LINED

American Hard Rubber Co., New York, N. Y. (Rubber)
Bart Mfg. Corp., Belleville, N. J.
Cement Lined Pipe Co., Lynn, Mass. (Lead and tin)
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Gates Engineering Co., Wilmington, Del.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (ceramics & graphite)
Goodrich Co., B. F., Akron, O. (Rubber)
Heil Process Equipment Corp., Cleveland, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin)
Marquette Coppersmithing Co., Philadelphia, Pa.
Michigan Pipe Co., Bay City, Mich. (Wood, saran rubber)
National Lead Co., New York, N. Y. (Lead)
Northern Indiana Brass Co., Elkhart, Ind. (Tinned)
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (lead)

Saran Lined Pipe Co., Ferndale, Mich.
United States Rubber Co., New York, N. Y. (Rubber)
Warren Foundry & Pipe Corp., New York, N. Y. (cement)

FITTINGS, PIPE, ALUMINUM

Aircraft Fitting Co., Cleveland, O.
Aluminum Co. of America, Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Robinson Corp., Roselle Park, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering, Youngstown, O.

FITTINGS, PIPE, BRASS, THREADED

Acheson Mfg. Co., Rankin, Pa.
Aircraft Fitting Co., Cleveland, O.
American Manganese Bronze Co., Philadelphia, Pa.
Bowser, Inc., Fort Wayne, Ind.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Couplings Co., The, Chicago, Ill.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grinnell Co., Inc., Providence, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Imperial Brass Mfg. Co., Chicago, Ill.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Leavitt Machine Co., Orange, Mass.
Madden Brass Products Co., Aurora, Ill.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Moran Flexible Joint Co., Louisville, Ky.
New York Brass Fdry., New York, N. Y.
Parker Appliance Co., Cleveland, O.
Penn Mfg. Corp., of Washington, Pa., Washington, Pa.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Union Metal Wks., Chelsea, Mass.
Weatherhead Co., The, Cleveland, O.

FITTINGS, PIPE, BRASS, WELDING

Chase Brass & Copper Co., Waterbury, Conn.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Robinson Corp., Roselle Park, N. J.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y. (Brazed)

FITTINGS, PIPE, BRONZE, BRAZED

American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Union Metal Works, Chelsea, Mass.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, BRONZE, SOLDER

Acheson Mfg. Co., Rankin, Pa.
American Brass Co., Waterbury, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Everhot Products Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
General Fittings Co., Providence, R. I.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Moran Flexible Joint Co., Louisville, Ky.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Union Malleable Mfg. Co., Ashland, O.
Union Metal Works, Chelsea, Mass.

FITTINGS, PIPE, CAST IRON, FLANGED

Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Frick Co., Waynesboro, Pa.
Goodall Rubber Co., Trenton, N. J.
Grinnell Co., Inc., Providence, R. I.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kuhns Bros. Co., Dayton, O.
Leavitt Machine Co., Orange, Mass.
Malleable Iron Fittings Co., Branford, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Parks-Cramer Co., Fitchburg Mass. (Jacketed)
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Stockham Valves & Fittings, Birmingham, Ala.
Straight Line Foundry & Machine Corp., Direct Separator Div., The, Syracuse, N. Y.
United States Pipe & Foundry Co., Birmingham, Ala.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.
Warren Foundry & Pipe Corp., New York.
York Corp., York, Pa.

FITTINGS, PIPE, CAST IRON, THREADED

Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Frick Co., Waynesboro, Pa.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kuhns Bros. Co., Dayton, O.
Leavitt Machine Co., Orange, Mass.
Malleable Iron Fittings Co., Branford, Conn.
Ravena Iron Co., Ravena, N. Y.
Sommerville Iron Works, Inc., Chattanooga, Tenn.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Plug & Fitting Co., Wellington, O. (pipe plug)
Union Malleable Mfg. Co., Ashland, O.
Vilter Mfg. Co., The, Milwaukee, Wis.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Zurn Mfg. Co., J. A., Erie, Pa.
York Corp., York, Pa.

FITTINGS, PIPE, COMPRESSION

Aircraft Fitting Co., Cleveland, O.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Hays Mfg. Co., Erie, Pa.
Quik Joint Div., Automatic Bending Co., Harvey, Ill.
York Corp., York, Pa.

FITTINGS, PIPE, HARD RUBBER

American Hard Rubber Co., New York, N. Y.
Goodrich Co., B. F., Akron, O.
Luzerne Rubber Co, Trenton, N. J.
Stokes Molded Products, Trenton, N. J.
United States Rubber Co., New York, N. Y.
Vanton Pump & Equipment Corp., New York.

FITTINGS, PIPE, JACKETED

Youngstown Welding & Engineering, Youngstown, O.

FITTINGS, PIPE, LEAD

Alpha Metals, Inc., Jersey City, N. J.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Gardiner Metal Co., Chicago, Ill.
Heil Process Equipment Corp., Cleveland, O.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Leavitt Machine Co., Orange, Mass.
Lissberger & Son, Inc., Marks, Long Island City, N. Y.
National Lead Co., New York, N. Y.
Northwest Lead Co., Seattle, Wash.
Resisto Pipe & Valve Co., East Cambridge, Mass.
Rochester Lead Works, Inc., Rochester, N. Y.

FITTINGS, PIPE, MALLEABLE

Corley Co., Inc., The, Jersey City, N. J.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Malleable Iron Fittings Co., Branford, Conn.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Rhode Island Fittings Co., Providence, R. I.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Union Malleable Mfg. Co., Ashland, O.
Union Pipe Fitting Co., Fort Atkinson, Wis.
Walworth Co., New York, N. Y.
Ward Foundries, Inc. J. P., Blossburgh, Pa.
York Corp., York, Pa.

FITTINGS, PIPE, MALLEABLE, BRAZED

Flagg & Co., Inc., Stanley G., Philadelphia, Pa.

FITTINGS, PIPE, NICKEL AND NICKEL ALLOY

American Manganese Bronze Co., Philadelphia, Pa.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Hasco Valve & Machine Co., Milwaukee, Wis.
International Nickel Co., Inc., The, New York, N. Y.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Robinson Corp., Roselle Park, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering, Youngstown, O.

FITTINGS, PIPE, PLASTIC

Acadia Synthetic Products Div., Western Felt Works, Chicago, Ill.
Alpha Plastics, Inc., W. Orange, N. J. (PVC)
American Agile Corp., Bedford, O.
American Hard Rubber Co., New York, N. Y.
Anesite Co., Chicago, Ill.
Aqua-Therm, Inc., Dayton, O.
Associated Plastic Co's., Inc., Midland, Mich. (rigid polyvinyl)
Atlas Mineral Products Co., Mertztown, Pa.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Chesflex Corp., Yonkers, N. Y.
Commercial Plastics Co., Chicago, Ill.
Continental Can Co., Millsplastic Pipe Div., New York, N. Y.
Continental-Diamond Fibre Co., Newark, Del.
Crane Co., Chicago, Ill.
Crescent Plastics, Inc., Evansville, Ind.
Franklin Plastics, Inc., Franklin, Pa.
Hartwell & Son, Inc., H. N., Boston, Mass.
Haveg Corp., Newark, Del.
Industrial Plastic Fittings Co., Cleveland, O.
Manufacturers Corp., Mansfield, O.
North Penn Co., New York, N. Y.
Protective Closures Co., Inc., Buffalo, N. Y. (cap and plug closures)

Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Philadelphia, Pa.
Republic Steel Corp., Cleveland, O.
Richland Co., Mansfield, O.
Robinson Clay Product Co., The, Akron, O.
Saran Lined Pipe Co., Ferndale, Mich.
Skyline Industries, Titusville, Pa.
Tenco, Inc., Winona, Minn.
Texas Vitrified Pipe Co., Mineral Wells, Tex.
Triangle Conduit & Cable Co., Plastic Products Div., Inc., New Brunswick, N. J.
Tube Turn Plastics, Inc., Louisville, Ky. (injection molded PVC, and others)
United States Stoneware Co., New York, N. Y.
Vanton Pump & Equipment Corp., New York, N. Y.
Wilmington Plastics Inc., Wilmington, Del.
Yardley Plastics Co., Columbus, O.

FITTINGS, PIPE, SADDLE TEE

Ladish Co., Cudahy, Wis.
Skinner Co., M. B., South Bend, Ind.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.

FITTINGS, PIPE, SANITARY

Acheson Mfg. Co., Rankin, Pa.
Duriron Co., Inc., The, Dayton, O. (corrosion resisting)
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Leavitt Machine Co., Orange, Mass.
Logan Clay Products Co., Logan, O.
Robinson Clay Product Co., The, Akron, O.
Stockham Valves & Fittings, Birmingham, Ala.
Union Malleable Mfg. Co., Ashland, O.

FITTINGS, PIPE, SPECIAL FOR BASEBOARD RADIATION

General Fittings Co., Providence, R. I., (special tee)
Hi-Flow Products, Inc., Lindenhurst, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Northern Indiana Brass Co., Elkhart, Ind.
Rittling Corp., The, Buffalo, N. Y.
Webster & Co., Warren, Camden, N. J.

FITTINGS, PIPE, STAINLESS STEEL

Aircraft Fitting Co., Cleveland, O.
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Alloy Stainless Products Co., Totowa, N. J.
Camco Products Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Fabri-Valve Co. of America, Portland, Ore.
Frasse & Co., Peter A., New York, N. Y.
Globe Steel Tubes Co., Milwaukee, Wis.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Michigan Pipe Co., Bay City, Mich.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Potts Co., Horace T., Philadelphia, Pa.
Pypon Co., Pittsburgh, Pa.
Robinson Corp., Roselle Park, N. J.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering, Youngstown, O.

FITTINGS, PIPE, STAINLESS STEEL, WELDING

Camco Products, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Hasco Valve & Machine Co., Milwaukee, Wis.
Key Co., East St. Louis, Ill.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Pypon Co., Pittsburgh, Pa.
Robinson Corp., Roselle Park, N. J.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Welding Fittings Corp., New Castle, Pa.
Youngstown Welding & Engineering Youngstown, O.

FITTINGS, PIPE, STEEL, FLANGED

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Bonney Forge & Tool Works, Allentown, Pa.
Crane Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Michigan Pipe Co., Bay City, Mich.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Semet-Solvay Engrg Div., Allied Chemical & Dye Corp., New York, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, STEEL, FORGED, THREADED

Alpha Plastics, Inc., W. Orange, N. J. (PVC)
American Meter Co., Inc., Philadelphia, Pa.
Bonney Forge & Tool Works, Allentown, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Larkin Packer Co., Inc., St. Louis, Mo.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

FITTINGS, PIPE, STEEL, SOCKET WELD

Bonney Forge & Tool Works, Allentown, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Grinnell Co., Inc., Providence, R. I
Ladish Co., Cudahy, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

FITTINGS, PIPE, STEEL, THREADED

Bonney Forge & Tool Works, Allentown, Pa.
Capitol Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Flodar Corp., Cleveland, O.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Gustin Bacon Mfg. Co., Kansas City, Mo.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Henry Valve Co., Melrose Park, Ill.
Ladish Co., Cudahy, Wis.
Parker Appliance Co., The, Cleveland, O.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Tubing Seal-Cap, Inc., San Gabriel, Calif. (plugs and caps)
U. S. Plug & Fitting Co., Wellington, O, (pipe plugs)
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

FITTINGS, PIPE, STEEL, WELDING

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Bonney Forge & Tool Works, Allentown, Pa.
Crane Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Electric Steel Foundry Co., Portland, Ore.
Globe Steel Tubes Co., Milwaukee, Wis.
Grinnell Co., Inc., Providence, R. I.
Gustin Bacon Mfg. Co., Kansas City, Mo.
Heat & Power Corp., Baltimore, Md.
Ladish Co., Cudahy, Wis.
Larkin Packer Co., Inc., St. Louis, Mo.
Lumsden & Van Stone Co., Div. of Midwest Piping Co., Inc., South Boston, Mass.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pipeline Development Co., Cleveland, O.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., The, Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Youngstown Welding & Engineering, Youngstown, O.

FITTINGS, PIPE, STEEL, WELDING, SEAMLESS

Crane Co., Chicago, Ill.
Globe Steel Tubes Co., Milwaukee, Wis.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Northern Indiana Brass Co., Elkhart, Ind.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.

FITTINGS, PIPE, WROUGHT IRON, WELDING

Bonney Forge & Tool Works, Allentown, Pa.
Gustin Bacon Mfg. Co., Kansas City, Mo.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.

FITTINGS, REFRIGERATION

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
American Brass Co., Waterbury, Conn.
Bakeraire Corp., South Windham, Me.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Forging and Mfg. Co., Chicago, Ill.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ladish Co., Cudahy, Wis.
Madden Brass Products Co., Aurora, Ill.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Remco, Inc., Zelienople, Pa.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Plug & Fitting Co., Wellington, O. (pipe plugs)
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Wabash Corp., Chicago, Ill.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
Weatherhead Co., Cleveland, O.
Wittenmeier Machinery Co., Chicago, Ill.
X L Refrigerating Co., Inc., Chicago, Ill.
York Corp., York, Pa.

FITTINGS, STEEL TUBE, FLARED
Aircraft Fitting Co., Cleveland, O.
Couplings Co., Chicago, Ill.
Crawford Fitting Co., Cleveland, O.
Flodar Corp., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Imperial Brass Mfg. Co., Chicago, Ill.
Parker Appliance Co., The, Cleveland, O.
Weatherhead Co., The, Cleveland, O.

FITTINGS, STEEL TUBE, FLARELESS
Chicago Forging and Mfg. Co., Chicago, Ill.
Flodar Corp., Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Parker Appliance Co., The, Cleveland, O.
Weatherhead Co., The, Cleveland, Ohio
Youngstown Welding & Engineering, Youngstown, O.

FLAME CONTROLS
See Controls, Flame Failure

FLAME CUTTERS
See Cutters, Flame

FLANGE BOLTS
See Bolts and Studs, Flange

FLANGE SEPARATORS
See Separators, Flange

FLANGES, ORIFICE
American Meter Co., Inc., Philadelphia, Pa.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Foxboro Co., Foxboro, Mass.
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Ladish Co., Cudahy, Wis.
Madden Corp., The, Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Phil Rich Fan Mfg. Co., Houston, Tex.
Taylor Forge & Pipe Wks., Chicago, Ill.
Trimount Instrument Co., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.

FLANGES, PIPE, ALLOY STEEL, LAP JOINT
Alloy Steel Products Co., Linden, N. J.
Camco Products, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Globe Steel Tubes Co., Milwaukee, Wis.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, ALLOY STEEL, SCREWED
Camco Products Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Globe Steel Tubes Co., Milwaukee, Wis.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, ALLOY STEEL, WELDING
Camco Products Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Globe Steel Tubes Co., Milwaukee, Wis.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Key Co., East St. Louis, Ill.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, ALUMINUM, WELDING
Ladish Co., Cudahy, Wis.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, BRASS, SCREWED
Acheson Mfg. Co., Rankin, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Providence, R. I.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Moran Flexible Joint Co., Louisville, Ky.
National Valve & Mfg. Co., Pittsburgh, Pa.
Northern Indiana Brass Co., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Ritter Pattern & Casting Co., New York, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Union Metal Works, Chelsea, Mass.
Walworth Co., New York, N. Y.

FLANGES, PIPE, CAST IRON, SCREWED
Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Frick Co., Waynesboro, Pa.
G. & H Mfg. Co., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kuhns Bros. Co., Dayton, O.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Ravena Iron Co., Ravena, N. Y.
Ritter Pattern & Casting Co., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
Straight Line Foundry & Machine Corp., Direct Separator Div., Syracuse, N. Y.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Warren Foundry & Pipe Corp., New York, N. Y.
York Corp., York, Pa.

FLANGES, PIPE, MALLEABLE IRON, SCREWED
Bakeraire Corp., South Windham, Me.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Jefferson Union Co., New York, N. Y.
National Valve & Mfg. Co., Pittsburgh, Pa.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
York Corp., York, Pa.

FLANGES, PIPE, NICKEL AND NICKEL ALLOY
Camco Products, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Hasco Valve & Machine Co., Milwaukee, Wis.
International Nickel Co., Inc., The, New York, N. Y.
Ladish Co., Cudahy, Wis.
Marquette Coppersmithing Co., Philadelphia, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Star Stainless Screw Co., Paterson, N. J.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Welding Fittings Corp., New Castle, Pa.

FLANGES, PIPE, STEEL, FORGED
Camco Products, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Globe Steel Tubes Co., Milwaukee, Wis.
Grinnell Co., Inc., Providence, R. I.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, STEEL, LAP JOINT
Camco Products, Inc., North Haven, Conn.
Chicago Metal Mfg. Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Globe Steel Tubes Co., Milwaukee, Wis.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Ladish Co., Cudahy, Wis.
Lumsden & Van Stone Co., Div. of Midwest Piping Co., Inc., South Boston, Mass.
Marquette Coppersmithing Co., Philadelphia, Pa.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Welding Fitting Corp., New Castle, Pa.

FLANGES, PIPE, STEEL, SCREWED
Camco Products, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Frick Co., Waynesboro, Pa.
G & H Mfg. Co., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Ladish Co., Cudahy, Wis.

Lumsden & Van Stone Co., Div. of Midwest Piping Co., Inc., South Boston, Mass.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Pennsylvania Forge Co., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
U. S. Plug & Fitting Co., Wellington, O.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FLANGES, PIPE, STEEL, WELDING

Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Atlantic Steel Co., Atlanta, Ga.
Bonney Forge & Tool Works, Allentown, Pa.
Butler, Inc., H. F., Union, N. J.
Camco Products, Inc., North Haven, Conn.
Crane Co., Chicago, Ill.
Globe Steel Tubes Co., Milwaukee, Wis.
Grinnell Co., Inc., Providence, R. I.
Harrisburg Steel Corp., Harrisburg, Pa.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Key Co., East St. Louis, Ill.
Ladish Co., Cudahy, Wis.
Lumsden & Van Stone Co., Div. of Midwest Piping Co., Inc., South Boston, Mass.
Midwest Piping Co., Inc., St. Louis, Mo.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Pennsylvania Forge Co., Philadelphia, Pa.
Phoenix Mfg. Co., Joliet, Ill.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Roessing Mfg. Co., Pittsburgh, Pa.
Somet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Taylor Forge & Pipe Works, Chicago, Ill.
Tube Turns, A Div. of National Cylinder Gas Co., Louisville, Ky.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.

FLARED FITTINGS, COPPER TUBE

See Fittings, Copper, Tube, Flared

FLARED FITTINGS, STEEL TUBE

See Fittings, Steel Tube, Flared

FLARING TOOLS FOR TUBING

See Tools, Flaring

FLEXIBLE COUPLINGS

See Couplings, Flexible

FLEXIBLE DUCT CONNECTIONS

See Connections, Duct, Flexible

FLEXIBLE METAL HOSE

See Hose, Metal and Fittings

FLOAT SWITCHES

See Switches, Float

FLOAT VALVES

See Valves, Float

FLOATS, STEAM TRAP, ETC.

Armstrong Machine Wks., Three Rivers, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Chicago Float Works, Not Inc., Chicago, Ill.
Crane Co., Chicago, Ill.
Harris & Co., Arthur, Chicago, Ill. (all metals)
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Kieley & Mueller, Inc., Middeltown, N. Y.
McAlear Mfg. Co., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Naugatuck Mfg. Co., Union City, Conn.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Owens & Co., Inc., Henry, Cranston, R. I.
Reichert Float & Mfg. Co., Toledo, O.
Reliance Gauge Column Co., Cleveland, O.
Sterling Engineering Mfg. Corp., Hyde Park, Mass.
Trane Co., The, La Crosse, Wis.
Watson & McDaniel Co., Philadelphia, Pa.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

FLOOR AND CEILING PLATES

See Plates, Floor and Ceiling

FLOW CONTROL VALVES

See Valves, Flow Control

FLOW MEASURING NOZZLES AND TUBES

See Nozzles, Flow Measuring

FLOW METERS

See Meters, Flow

FLOW SWITCHES

See Switches, Flow

FORGED STEEL VALVES

See Valves, Forged Steel

FRAMES, AIR INLET, PREFABRICATED, FOR AIR CONDITIONING UNITS

Livesay Window Co., Miami, Fla.

FRESHENERS, AIR

See Adsorbers, Odor; Compounds, Air Freshening

FUEL OIL LEAK DETECTORS

See Detectors, Leak, Fuel Oil

FUEL ECONOMIZERS

See Economizers, Fuel

FUEL OIL UNITS

See Units, Fuel Oil

FURNACES, DUCT

See Heaters, Duct

FURNACES, WARM AIR, FOR INDUSTRIAL AND LARGE BUILDING CENTRAL HEATING

(Exclusively for duct distribution of air—300,000 Btu per hr and over) For direct fired heaters, which may be located in the space heated or may be used in central plant installations with duct distribution of the air, see the listings under Heaters, Air, Direct Fired.

Air Conditioning Engineering Co., Cambridge, Mass.
Aladdin Heating Corp., San Leandro, Calif.
American Foundry & Furnace Co., Bloomington, Ill.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Arcweld Mfg. Co., Inc., Seattle, Wash.
Armstrong Furnace Co., Columbus, O.
Auburn Foundry, Inc., Auburn, Ind.
Bard Mfg. Co., Bryan, O.
Beck Engineering Combustion Kompany, St. Louis, Mo.
Besser Metal Products, Corp., Charlotte, N. C.
Bonair Products, Inc., Colwyn, Pa.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Century Engineering Corp., Cedar Rapids, Ia.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
International Heater Co., Utica 2, N. Y.
International Sales Co., San Francisco, Calif.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corporation, Wilmington, Del.
Lennox Furnace Co., Columbus, O.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Mammoth Furnace Co., St. Paul, Minn.
McPherson Furnace & Supply Co., Portland, Ore.
Meyer Furnace Co., The, Peoria, Ill.
Mueller Climatrol, Milwaukee, Wis.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Ray Oil Burner Co., San Francisco, Calif.
Rosebraugh Co., W. W., Salem, Ore.
Stewart-Warner Corp., U.S. Machine Div., Lebanon, Ind.
Surface Combustion Corp., Toledo, O.
Syncromatic Corp., Watertown, Wis.
Tjernlund Mfg. Co., St. Paul, Minn.
United States Radiator Corp., Detroit, Mich.
Waterman-Waterbury Co., The, Minneapolis, Minn.

FUSIBLE LINKS

See Links, Fusible

GAGE GLASSES

See Glasses, Gage

GAGE SETS, REFRIGERATION

Henry Valve Co., Melrose Park, Ill.
Shank Co., Cyrus, Chicago, Ill.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.

GAGE TESTERS

See Testers, Gage, Dead Weight

GAGES, AIR FILTER

Bacharach Industrial Instrument Co., Pittsburgh, Pa. (filter gauge)
Defender Instrument and Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Chicago, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Hays Corp., Michigan City, Ind.
Herbusch Corp., The, St. Louis, Mo. (Warning device)
Hill, E. Vernon, Chicago, Ill.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Meriam Instrument Co., The, Cleveland, O.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.

GAGES, INDICATING, DRAFT

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Canton Stoker Corp., Canton, O.
Cleveland Fuel Equipment Co., Cleveland, O.
Cole-Sewell Engineering Co., St. Paul, Minn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Chicago, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hays Corp., Michigan City, Ind.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Illinois Testing Laboratories, Inc., Chicago, Ill.
King Engineering Corp., Ann Arbor, Mich.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Perfex Corp., Milwaukee, Wis.
Precision Scientific Co., Chicago, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.

GAGES, INDICATING, PRESSURE

Acragage Corp., Milford, Conn.
Air Conversion Research Corp., Chicago, Ill.
Ashton Valve Co., Wrentham, Mass.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Canton Stoker Corp., Canton, O.
Cleveland Fuel Equipment Co., Cleveland, O.
Control Engineering Corp., Controls Div., Norwood, Mass.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Dole Valve Co., The, Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.

Dwyer Mfg. Co., F. W., Chicago, Ill.
Electro Products Laboratories, Inc., Chicago, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
General Blower Co., Inc., Philadelphia, Pa.
Giannini & Co., Inc., G. M., Pasadena, Calif.
Hays Corp., Michigan City, Ind.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport, Conn.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Keller Tool Co., Grand Haven, Mich.
Lonergan Co., J. E., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Meriam Instrument Co., The, Cleveland, O.
Mettler Co., Inc., The, Los Angeles, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
New York Air Valve Corp., Brooklyn, N. Y.
Norwalk Valve Co., South Norwalk, Conn.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Perfex Corp., Milwaukee, Wis.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Rochester Mfg. Co., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., New York, N. Y.

GAGES, INDICATING, VACUUM

Acragage Corp., Milford, Conn.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Ashton Valve Co., Wrentham, Mass.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Crosby Steam Gage Valve Co., Wrentham, Mass.
Defender Instrument and Regulator Co., St. Louis, Mo.
Detroit Brass & Malleable Co., Detroit, Mich.
Dickson Co., The, Chicago, Ill.
Dole Valve Co., The, Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.
Dwyer Mfg. Co., F. W., Chicago, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Giannini & Co., Inc., G. M., Pasadena, Calif.
Hastings Instrument Co., Inc., Warwick, Va.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport, Conn.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Lonergan Co., J. E., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
Norwalk Valve Co., South Norwalk, Conn.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Research Vacuum Supply Co., Chicago, Ill.
Republic Flow Meters Co., Chicago, Ill.
Rochester Mfg. Co., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Stokes Machine Co., F. J., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Wallace & Tiernan, Inc., Newark, N. J.
Weksler Thermometer Corp., New York, N. Y.

GAGES, LIQUID LEVEL

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
Ashton Valve Co., Wrentham, Mass.
Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Boston Auto Gage Co., Pittsfield, Mass.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Caldwell Co., W. E., Louisville, Ky.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Defender Instrument and Regulator Co., St. Louis, Mo.
Diamond Power Specialty Corp., Lancaster, O.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Frick Co., Waynesboro, Pa.
Giannini & Co., Inc., G. M., Pasadena, Calif.
Hays Corp., Michigan City, Ind.
Henry Valve Co., Melrose Park, Ill.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Chicago, Ill.
King Engineering Corp., Ann Arbor, Mich.
Krueger Sentry Gauge Co., Green Bay, Wis.
Liquidepth Indicators, Inc., Long Island City, N. Y.
Liquidometer Corp., Long Island City, N. Y.
Lonergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Marshalltown Mfg. Co., Marshalltown, Ia.
Mel-Gauge Co., East Haven, Conn.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Morse-Smith-Morse, Inc., Watertown, Mass.
Nason Co., Clarkston, Mich.
New York Air Valve Corp., Brooklyn, N. Y.
Penberthy Injector Co., Detroit, Mich.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Powell Co., Wm., Cincinnati, O.
Reliance Gauge Column Co., Cleveland, O.
Republic Flow Meters Co., Chicago, Ill.
Rochester Mfg. Co., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Shank Co., Cyrus, Chicago, Ill.
Simplex Valve & Meter Co., Philadelphia, Pa.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Strahman Valves, Inc., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Swift Lubricator Co., Elmira, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Thermo Instrument Co., Belmont, Calif.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Visa-Test Sales Co., Burlingame, Calif.
Wallace & Tiernan Co., Newark, N. J.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (water)
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.
York Corp., York, Pa.

GAGES, OIL TANK

Applied Mechanics Co., Boston, Mass.
Boston Auto Gage Co., Pittsfield, Mass.
Boston Machine Works Co., Lynn, Mass.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Foxboro Co., Foxboro, Mass.
King Engineering Corp., Ann Arbor, Mich.
Krueger Sentry Gauge Co., Green Bay, Wis.
Liquidepth Indicators, Inc., Long Island City, N. Y.
Liquidometer Corp., Long Island City, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mel-Gauge Co., New Haven, Conn.
Penberthy Injector Co., Detroit, Mich.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Scully Signal Co., Melrose, Mass.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Viking Pump Co., Cedar Falls, Ia.

GAGES, PIPE

Greenfield Tap & Die Corp., Greenfield, Mass. (Thread)
Treadwell Tap & Die Co., Greenfield, Mass.
Three Point Industries, Chicago, Ill.

GALVANIZED SHEETS

See Sheets, Steel, Galvanized

GALVANNEALED SHEETS

See Sheets, Steel, Galvannealed

GARAGE VENTILATION FITTINGS

See Fittings, Exhaust, Garage, for Attaching Car Exhaust Pipe

GAS BURNERS

See Burners, Gas

GAS ENGINES

See Engines, Gas

GAS FIRED RADIATORS

See Radiators, Gas Fired

GAS PRESSURE REGULATORS

See Regulators, Pressure, Gas

GAS VENT AND FLUE PIPE

See Pipe and Fittings, Gas Vent and Flue

GAS VOLUME METERS

See Meters, Volume, Air and Gas

GASKETS

Acadia Synthetic Products Div., Western Felt Works, Chicago, Ill. (Felt, rubber)
Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Akron Metallic Gasket Co., Akron, O.
Alpha Metals, Inc., Jersey City, N. J.
American Felt Co., Glenville, Conn.
Anchor Packing Co., Philadelphia, Pa. (Asbestos)
Armstrong Cork Co., Lancaster, Pa. (Cork & cork composition)
Baldwin Belting, Inc., New York, N. Y.
Belmont Packing & Rubber Co., Philadelphia, Pa.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y. (Lead)
Brady Co., W. H., Milwaukee, Wis.
Carey Mfg. Co., Philip, Cincinnati, O.
Chase Brass & Copper Co., Waterbury, Conn. (Brass and copper)
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Chicago-Wilcox Mfg. Co., Chicago, Ill.
Clow & Sons, James B., Chicago, Ill.
Continental-Diamond Fibre Co., Newark, Del.
Continental Rubber Wks., Erie, Pa.
Crane Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y. (Asbestos)
Durabla Mfg. Co., New York, N. Y. (Asbestos fibre)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Excelsior Leather Washer Mfg. Co., Rockford, Ill.
Federated Metal Div., American Smelting & Refining Co., New York, N. Y.
Felt Products Mfg. Co., Chicago, Ill. (Heat and oil resisting)
Felters Company, The, Boston, Mass.
Flexitallic Gasket Co., Camden, N. J. (Metal, asbestos)
Flexlock Corp., Kent, O.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gatke Corp., Chicago, Ill.
General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Grant Wilson Inc., Chicago, Ill. (asbestos)
Graton & Knight Co., Worcester, Mass. (Leather)

Greene, Tweed & Co., North Wales, Pa.
Hewitt-Robins, Inc., Hewitt Rubber Div., Buffalo, N. Y.
Houghton & Co., E. F., Philadelphia, Pa. (Leather)
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Linear Incorporated, Philadelphia, Pa.
Metallo Gasket Co., New Brunswick, N. J. (Metal, metal asbestos)
McCord Corp., Detroit, Mich.
Mortell Co., J. W., Kankakee, Ill.
National Engineering Products, Inc., Washington, D. C. (Plastic)
National Lead Co., New York, N. Y. (lead)
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Products Research Co., Los Angeles, Calif.
Quaker Rubber Corp., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber and asbestos)
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Sall Mountain Co., Hamilton, O. (asbestos)
Saran Lined Pipe Co., Ferndale, Mich.
Schieren Co., Chas. A., New York, N. Y.
Sponge Rubber Products Co., The, Shelton, Conn.
Spring Packing Corp., Chicago, Ill.
Steel Improvement & Forge Co., Cleveland, O.
Stokes Molded Products, Trenton, N. J. (Hard rubber)
Strahman Valves, Inc., New York, N. Y.
Technical Ply-Woods, Chicago, Ill.
Thermoid Co., Trenton, N. J.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Gasket Co., Camden, N. J.
United States Rubber Co., New York, N. Y. (Rubber, asbestos)
United States Stoneware Co., New York, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Vickers, Inc., Div. of Sperry Corp., El Segundo, Calif.
Western Felt Wks., Chicago, Ill. (Felt)
Wolfe Co., Inc., The, Franklin C., 3644 Eastham Drive., Culver City, Calif.
Zimmerman Packing Co., Cincinnati, O. (also gasket cutters)

GASOLINE FIRED HEATERS

See Heaters, Gasoline Fired

GAS VENT AND FLUE PIPE AND FITTINGS

See Pipe and Fittings, Gas Vent and Flue

GATES, BLAST

Allington & Curtis Mfg. Co., Saginaw, Mich.
Berger Bros., Co., Philadelphia, Pa.
Buffalo Forge Co., Buffalo, N. Y.
Champion Blower & Forge Co., Lancaster, Pa.
Clarage Fan Co., Kalamazoo, Mich.
Day Co., The, Minneapolis, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Goethel Sheet Metal Works, Alfred, Milwaukee, Wis.
Indiana Fan Co., Indianapolis, Ind.
Kirk & Blum Mfg. Co., Cincinnati, O.
Maysteel Products, Inc., Milwaukee, Wis.
Newcomb-Detroit Co., Detroit, Mich.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Rockwell Co., W. S., Fairfield, Conn.
Spencer Turbine Co., Hartford, Conn.
Western Blower Co., Seattle, Wash.
Winkler & Sons, Inc., A. E., Milwaukee, Wis.

GENERATORS, STEAM, ELECTRIC (Electrically "Fired" Boilers)

Berry-Hill Corp., Hill Diesel Engine Div., Providence, R. I. (diesel)
Bigelow Co., The, New Haven, Conn.
Custom Engrg. Co., Los Angeles, Calif.
Hill Diesel Engine Corp., Lansing, Mich.
Livingstone Engineering Co., Worcester, Mass.
Orr & Sembower, Inc., Reading, Pa. (electric fired boilers)

GLASS, HEAT ABSORBING

See Windows, Heat Insulating

GLASS PIPE

See Pipe, Glass

GLASSES, GAGE

Associated Valve & Engineering Co., Chicago, Ill.
Bache, Semon & Co., New York, N. Y.
Chicago Specialty Mfg. Co., Chicago, Ill.
Chesterton Co., A. W., Everett, Mass.
Corning Glass Works, Corning, N. Y.
Daigger & Co., A., Chicago, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.
Detroit Brass & Malleable Co., Detroit, Mich.
Diamond Power Specialty Corp., Lancaster, O.
Ernst Water Column & Gauge Co., Livingston, N. J.
Henry Valve Co., Melrose Park, Ill.
Libbey-Owens-Ford Glass Co., Toledo, O.
New York Air Valve Corp., Brooklyn, N. Y.
O P W Corp., Cincinnati, O.
Penberthy Injector Co., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Scientific Instrument Co., Detroit, Mich.
Strahman Valves, Inc., New York, N. Y.
Superior Controls Co., Inc., Los Angeles, Calif.
Swift Lubricator Co., The, Elmira, N. Y.
Vilter Mfg. Co., The, Milwaukee, Wis.

GLASSES, SIGHT, FOR PIPE LINES

Allin Mfg. Co., Chicago, Ill.
American District Steam Co., Inc., North Tonawanda, N. Y.
Bowser, Inc., Fort Wayne, Ind.
Chesterton Co., A. W., Everett, Mass.
Cochrane Corp., Philadelphia, Pa.
Corning Glass Works, Corning, N. Y.
Fischer & Porter Co., Hatboro, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Libbey-Owens-Ford Glass Co., Toledo, O.
Mueller Brass Co., Port Huron, Mich.
Norwood Associated Engineers, Inc., Springfield, Mass.
O P W Corp., Cincinnati, O.
Penberthy Injector Co., Detroit, Mich.
Remco, Inc., Zelienople, Pa. (for refrigerant lines)
Sarco Co., Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Swift Lubricator Co., The, Elmira, N. Y.
Trinity Equipment Corp., Roselle Park, New Jersey
Webster & Co., Warren, Camden, N. J.

GLOBE VALVES

See Valves, Globe

GLYCOL VAPORIZERS

See Units, Sterilizing, Air

GOVERNORS, PUMP

Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Burrows Mfg. Co., F. A., York, Pa.
Cash Co., A. W., Decatur, Ill.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hagan Corp., Pittsburgh, Pa.
Keckley Co., O. C., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Synchro-Start Products, Inc., Skokie, Ill.
Swartwout Co., The, Cleveland, O.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Willams Gauge Co., Inc., The, Pittsburgh, Pa.

GRILLES

See also Diffusers; Panels, Perforated, for Air Diffusion; Registers

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Air-Path Products Co., Baltimore, Md. (stamped steel)
Alton Mfg. Co., Dallas, Tex.
American Warming & Ventilating Co., Toledo, O.
Auer Register Co., Cleveland, O.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Beckley Perforating Co., Garwood, N. J.
Best Register Co., Milwaukee, Wis.
Central Wire & Iron Works, Des Moines, Ia.
Char-Gale Mfg. Co., Minneapolis, Minn.
Colonial Alloys Co., Metals Div., Philadelphia, Pa.
Controlair Mfg. Co., Los Angeles, Calif.
Crown Iron Works, Minneapolis, Minn.
Decatur Iron & Steel Co., Decatur, Ala.
Diamond Mfg. Co., Wyoming, Pa.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Erdle Perforating Co., Rochester, N. Y.
General Register Corp., Cedar Grove, N. J.
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Hendrick Mfg. Co., Carbondale, Pa.
Independent Register Co., Cleveland, O.
Jamieson Mfg. Co., Dallas, Tex.
Johnston & Chapman Co., Chicago, Ill.
Lima Register Co., The, Lima, O.
Lockjoint Wood Products Co., Wichita, Kans. (Wood)
Louvra Corp., The, Union, N. J.
Manhattan Perforated Metal Co., Inc., Long Island City, N. Y.
Martin Metal Products Corp., Ferndale, Mich.
Midco Register Corp., St. Paul, Minn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mundt & Sons, Charles, Jersey City, N. J.
Palmer Mfg. Corp., Phoenix, Ariz.
Pennant Corp., Grand Rapids, Mich.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Reliable Perforating Co., Chicago, Ill.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Standard Stamping & Perforating Co., Chicago, Ill.
Stewart Mfg. Co., Inc., Cedar Grove, N. J.
Titus Mfg. Corp., Waterloo, Iowa.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Viking Mfg. Corp., Cleveland, O.
Waterloo Register Co., Inc., Waterloo, Ia.
Western Wire & Iron Works, Inc., Chicago, Ill. (metal)
Wickwire Spencer Steel, Div. of Colorado Fuel & Iron Corp., New York, N. Y.
Young Regulator Co., Cleveland, O.

GRINDERS AND GRINDING WHEELS, WELD

Anderson & Co., Inc., Sioux City, Ind.
Baldor Electric Co., St. Louis, Mo.
Black & Decker Mfg. Co., The, Towson, Md.
Buckeye Tools Corp., Dayton, O.
Chicago Pneumatic Tool Co., New York, N. Y.
Cincinnati Electrical Tool Co., The, Cincinnati, O.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Diehl Mfg. Co., Finderne Plant, Somerville, N. J.
Generator Sales Co., Chicago, Ill.
Mall Tool Co., Chicago, Ill.
Milwaukee Electric Tool Corp., Milwaukee, Wis.
Norton Co., Worcester, Mass.
Raybestos-Manhattan, Inc., Passaic, N. J.
Rotor Tool Co., Cleveland, O.
Skil Corp., Chicago, Ill.
Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago, Ill.

Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Stanley Works, The, New Britain, Conn.
Thor Power Tool Co., Aurora, Ill.

GUNS AND POTS, SMOKE AND SMUDGE, FOR TESTING AIR MOVEMENT

Hill & Co., Vernon E., Lake Geneva, Wis.
Kilgore, Inc., Westerville, O.
Mine Safety Appliances Co., Pittsburgh, Pa.
Newco Products, New York, N. Y. (smoke containers)
Unexcelled Chemical Corp., New York, N. Y.

HAND SHEARS

See Shears and Snips, Hand

HANGERS OR BRACKETS, RADIATOR

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Arjac Products, Inc., Rochester, N. Y.
Carpenter & Paterson, Inc., Cambridge, Mass.
Carty & Moore Engineering Co., Detroit, Mich.
Crawford Co., Chicago, Ill.
Fee & Mason Mfg. Co., Manasquan, N. J.
Gateway Engineering Co., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Hartmann Co., Chas., Brooklyn, N. Y.
Healy Ruff Co., St. Paul, Minn.
Jennison Co., Fitchburg, Mass. (Adjustable radiator foot rest)
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
National Radiator Co., The, Johnstown, Pa.
Radiant-Ray Radiation, Inc., Newington, Conn.
Rittling Corp., The, Buffalo, N. Y.
Unistrut Products Co., Chicago, Ill.
United States Radiator Corp., Detroit, Mich.

HANGERS AND SUPPORTS, DUCT

Acme Mfg. Co., Holmesburg, Philadelphia, Pa.
Atlantic Steel Co., Atlanta, Ga.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Hexdall Co., A. M., Morris, Ill.
Moore Inc., Goodloe E., Danville, Ill.
Phillips Drill Co., Michigan City, Ind. (self-drilling expansion shells)
Powder Power Tool Corp., Portland, Ore.
Unistrut Products Co., Chicago, Ill.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa. (cartridge stud driver)
Waverly Heating Supply Co., Boston, Mass.

HANGERS AND SUPPORTS, PIPE

Air-Path Products Co., Baltimore, Md. (inserts)
American District Steam Co., Inc., North Tonawanda, N. Y.
American Tube Products, Inc., Natick, R. I. (copper tube)
Armart Mfg. Co., Pittsfield, Mass. (copper tube hangers & straps, wire pipe hooks, galv. pipe straps, and perforated hanger iron)
Atlantic Steel Co., Atlanta, Ga. (perforated pipe hanger)
Bergen Pipesupport Corp., New York, N. Y. (variable spring constant support)
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa. (spring and solid)
Carpenter & Paterson, Inc., Cambridge, Mass.
Chase Brass & Copper Co., Waterbury, Conn. (copper strap)
Commercial Plastics Co., Chicago, Ill. (plastic strap)
Crane Co., Chicago, Ill.
Crawford Co., Chicago, Ill.
Farley Sleeve & Hanger Co., Cleveland, O.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Frick Co., Waynesboro, Pa.
G & H Mfg. Co., Philadelphia, Pa. (hook)
Gateway Engineering Co., Chicago, Ill.
General Fittings Co., Providence, R. I. (strap hangers)
Gerrard & Co., A. J., Melrose Park, Ill. (strap)
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Heller Co., The, Cleveland, O. (automatic stapler for copper tube)
Hupp Corp., Globe Stamping Div., Cleveland, O.
Korfund Co., Inc., Long Island City, N. Y.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y. (spring hangers and roller hangers)
Minerallac Electric Co., Chicago, Ill.
Moore Inc., Goodloe E., Danville, Ill.
National Valve & Mfg. Co., Pittsburgh, Pa. (counterpoise)
Northern Indiana Brass Co., Elkhart, Ind. (copper tube)
Paine Co., Addison, Ill.
Phillips Drill Co., Michigan City, Ind. (self-drilling expansion shells)
Piping Specialties, Inc., New York, N. Y. (anchor and guide for expansion joints)
Powder Power Tool Corp., Portland, Ore.
Ramset Div., Olin Mathieson Chemical Corp., Cleveland, O. (conduit clips)
Ravena Iron Co., Ravena, N. Y. (hook plates)
Risdon Mfg. Co., The, John M. Russell Div., Naugatuck, Conn. (wire pipe hooks)
Ritter Pattern & Casting Co., New York, N. Y. (jack type adjustable tunnel stanchion)
Rockwood Sprinkler Co., Worcester, Mass.
Roessing Mfg. Co., Pittsburgh, Pa.
Schaub Engineering Co., Fred H., Chicago, Ill. (pipe stands)
Steinen Mfg. Co., Wm., Newark, N. J.
Titchener, E. H. & Co., Binghamton, N. Y. (wire staples for copper & brass tubing)
Truscon Steel Div., Republic Steel Corp., Youngstown, O. (pressed steel inserts)
Unistrut Products Co., Chicago, Ill.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa. (cartridge stud driver)
Vibration Mounting, Inc., Elmhurst, N. Y. (vibration hangers)
Walworth Co., New York, N. Y.
Western Wire Products Co., St. Louis, Mo. (wire pipe hooks and perforated hanger iron)

HARD RUBBER PIPE AND FITTINGS

See Pipe, Hard Rubber; Fittings, Pipe, Hard Rubber

HARDWARE

See Parts for Heating and Air Conditioning Equipment

HEADERS, PIPE, WELDED

Albert Pipe Supply Co., Brooklyn, N. Y.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
Atlantic Pipe Bending & Fabricating Corp., Wood-Ridge, N. J.
Bakeraire Corp., South Windham, Me.
Biggs Boiler Wks. Co., The, E. Akron, O.
Blaw Knox Co., Power Piping and Sprinkler Div., Pittsburgh, Pa.
Buffalo Tank Corp., Dunellen, N. J.
Chicago Nipple Mfg. Co., Cicero, Ill.
Clow & Sons, James B., Chicago, Ill.
Cobra Pipe & Coil Co., Inc., Elmwood, Conn.
Columbian Steel Tank Co., Kansas City, Mo.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crane Co., Chicago, Ill.
Downingtown Iron Works, Downingtown, Pa.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Flori Pipe Co., The, St. Louis, Mo.
Fluor Corp., Ltd., The, Los Angeles, Calif.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Heat & Power Corp., Baltimore, Md.
International Engineering Wks., Inc., Framingham, Mass.
Kellogg Co., M. W., The, New York, N. Y.
Lumsden & Van Stone Div. of Midwest Piping Co., Inc., South Boston, Mass.
Manning & Lewis Engineering Co., Newark, N. J.
Marquette Coppersmithing Co., Philadelphia, Pa.
Michigan Pipe Co., Bay City, Mich.
Midwest Piping Co., Inc., St. Louis, Mo.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
National Pipe Bending Co., New Haven, Conn.
National Valve & Mfg. Co., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Ohio Pipe Bending & Mach. Co., Cleveland, O.
Philadelphia Pipe Bending Co., Philadelphia.
Pittsburgh Pipe Coil & Bending Co., Etna, Pa.
Pittsburgh Piping & Equipment Co., Pittsburgh, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Red Jacket Co., Inc., Pittsburgh, Pa.
Rempe Co., Chicago, Ill.
Richmond Engineering Co., Inc., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Sales & Co., Murray W., Detroit, Mich.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Shaw Co., Benjamin F., Wilmington, Del.
Shaw Kendall Engineering Co., Toledo, O.
Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., Milwaukee, Wis.
Western Piping & Engineering Co., San Francisco, Calif.
Whitlock Mfg. Co., Hartford, Conn.

HEADS, EXHAUST, FOR PIPE LINES

Anderson Co., V. D., The, Cleveland, O.
Brighton-Dickinson Div., Chicago, Ill.
Centrifix Corp., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Flori Pipe Co., The, St. Louis, Mo.
Hoppes Mfg. Co., Inc., Springfield, O.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Swartwout Co., The, Cleveland, O.
U. S. Pipe & Mfg. Co., San Francisco, Calif.
Wright-Austin Co., Detroit, Mich.

HEADS, SAFETY

Black, Sivalls & Bryson, Inc., Kansas City, Mo.

HEADS, SPRINKLER, FOR FIRE PROTECTION

Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Grinnell Co., Inc., Providence, R. I.
Hodgman Mfg. Co., Inc., Taunton, Mass.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Water Cooling Corp., New York, N. Y.

HEAT EXCHANGERS

See Chillers, Water; Condensers, Refrigerating; Exchangers, Heat; Surface, Cooling; Surface, Heating

HEAT PUMPS

See Units, Air Conditioning, Reverse Refrigeration Cycle

HEAT RECOVERY UNITS

See Units, Heat Recovery

HEAT REGENERATORS

See Units, Heat Recovery

HEATERS, AIR, DIRECT FIRED, COAL

Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corporation, Wilmington, Del.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Rosebraugh Co., W. W., Salem, Ore.

HEATERS, AIR, DIRECT FIRED, COMBINATION GAS AND OIL

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
Besser Metal Products Corp., Charlotte, N. C.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corp., Wilmington, Del.
Mammoth Furnace Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.

Prat-Daniel Corp., South Norwalk, Conn.
Rockwell Co., W. S., Fairfield, Conn.
Ross Engineering Corp., J. O., New York, N. Y.
Todd Shipyards Corp., Combustion Equipment Div., Elmhurst, N. Y.

HEATERS, AIR, DIRECT FIRED, GAS, CENTRIFUGAL FAN TYPE

For Furnaces for Central Plant Installation EXCLUSIVELY for Duct Distribution of the Air, See the Listing Under Furnaces

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Foundry & Furnace Co., Bloomington, Ill.
American Furnace Co., St. Louis, Mo.
Auburn Burner Co., Auburn, Ind.
Automatic Gas Equipment Co., Pittsburgh, Pa.
Besser Metal Products Corp., Charlotte, N. C.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Dravo Corp., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
General Gas Light Co., Kalamazoo, Mich.
Hastings Air Conditioning Co., Inc., Hastings, Neb.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
International Sales Co., San Francisco, Calif.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Mueller Climatrol, Milwaukee, Wis.
Nat Corp., Kansas City, Mo.
National Heater Co., St. Paul, Minn.
Newcomb-Detroit Co., Detroit, Mich.
Norge Heat Div., Borg-Warner Corp., Detroit, Mich.
Norman Products Co., Inc., Columbus, O.
Olson & Co., Arthur A., Canfield, O.
OverHead Heaters, Inc., Detroit, Mich.
Payne Furnace Div., Affiliated Gas Equipment Inc., Monrovia, Calif.
Peerless Mfg. Corp., Louisville, Ky.
Prat-Daniel Corp., South Norwalk, Conn.
Reznor Mfg. Co., Mercer, Pa.
Rockwell Co., W. S., Fairfield, Conn.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Surface Combustion Corp., Toledo, O.
Tjernlund Mfg. Co., St. Paul, Minn.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Vapor Heating Corp., Chicago, Ill.
Zink Co., John, Tulsa, Okla.

HEATERS, AIR, DIRECT FIRED, OIL, FLOOR TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Foundry & Furnace Co., Bloomington, Ill.
Campbell Co., E. K., Kansas City, Mo.
Campbell Heating Co., Des Moines, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
MaGirl Foundry & Furnace Co., Bloomington, Ill.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Prat-Daniel Corp., South Norwalk, Conn.
Ross Engineering Corp., J. O., New York.
Tjernlund Mfg. Co., St. Paul, Minn.
Vapor Heating Corp., Chicago, Ill.
Williams Div., Eureka Williams Co., Div. of Henney Motor Co., Inc., Bloomington, Ill.

HEATERS, AIR, DIRECT FIRED, OIL, PORTABLE, FOR INDUSTRIAL SPACE HEATING

Air Conditioning Engineering Co., Cambridge, Mass.
Auburn Burner Co., Auburn, Ind.
Bica Co., Girard, O. (50,000-85,000 Btu)
Cauhorn Distributing Co., Detroit, Mich. (190,000 Btu)
Chicago Steel Furnace Co., Chicago, Ill.
Delta Heating Corp., Trenton, N. J.
Fageol Heat Machine Co., Kent, O. (168,000 and 189,000 Btu)
Johnson Heater Corp., Chelsea, Mass. (500,000 Btu)
Mammoth Furnace Co., St. Paul, Minn. (200,000 — 2,000,000 Btu)
Master Vibrator Co., Dayton, O.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Prat-Daniel Corp., South Norwalk, Conn. (100,000 Btu up to 2,225,000 Btu)
Quiet Automatic Oil Burner Corp., Newark, N. J.
Tjernlund Mfg. Co., St. Paul, Minn.

HEATERS, AIR, DIRECT FIRED, OIL, SUSPENDED TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Furnace Co., St. Louis, Mo.
Auburn Burner Co., Auburn, Ind.
Auto-Therm Mfg. Co., Detroit, Mich.
Beck Engineering Combustion Kompany, St. Louis, Mo.
Besser Metal Products Corp., Charlotte, N. C.
Campbell Co., E. K., Kansas City, Mo.
Century Engineering Corp., Cedar Rapids, Ia.
Chicago Steel Furnace Co., Chicago, Ill.
Cox Mfg. Co., Ridgeville, Ind.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Fluid Heat Div., Anchor Post Products, Inc., Baltimore, Md.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Harvey-Whipple, Inc., Springfield, Mass.
Jackson & Church Co., Saginaw, Mich.
Johnson Heater Corp., Chelsea, Mass.
Lee Corp., Wilmington, Del.
Mueller Climatrol, Milwaukee, Wis.
National Heater Co., St. Paul, Minn.
Olson & Co., Arthur A., Canfield, O.
Olson Mfg. Co., C. A., Elyria, O.
OverHead Heaters, Inc., Detroit, Mich.
Petro, Cleveland, O.
Prat-Daniel Corp., South Norwalk, Conn.
Quiet Automatic Oil Burner Corp., Newark, N. J.
Tjernlund Mfg. Co., St. Paul, Minn.
Waterman-Waterbury Co., The, Minneapolis, Minn.
Weatherall Engineers, Inc., Providence, R. I.
Williams Div., Eureka Williams Co., Div. of Henney Motor Co., Inc., Bloomington, Ill.

HEATERS, CONVECTION

See Radiation, Convection Type

HEATERS, DUCT, ELECTRIC

Brown Fintube Co., The, Elyria, O.
Consolidated Metal Products Corp., Albany, N. Y.
Despatch Oven Co., Minneapolis, Minn.
Electromode Corp., Rochester, N. Y.
Falcon Equipment Co., New Brighton, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
Hynes Electric Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Tenney Engineering, Inc., Newark, N. J.
Trent, Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wing Mfg. Co., L. J., Linden, N. J.

HEATERS, DUCT, GAS

Allan Engineering Co., Dallas, Tex.
Automatic Gas Equipment Co., Pittsburgh, Pa.
Auto-Therm Mfg. Co., Detroit, Mich.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Carrier Corp., Syracuse, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.
General Gas Light Co., Kalamazoo, Mich.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
International Sales Co., San Francisco, Calif.
Kehm Corp., The, Chicago, Ill.
Meyer Furnace Co., The, Peoria, Ill.
Modine Mfg. Co., Racine, Wis.
National Heater Co., Inc., St. Paul, Minn.
Norman Products Co., Inc., Columbus, O.
Payne Furnace Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
Reznor Mfg. Co., Mercer, Pa.
Royal Jet, Inc., Alhambra, Calif.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Sterling Heat Specialties Inc., Westfield, Mass.
Surface Combustion Corp., Toledo, O.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.

HEATERS, DUCT, OIL FIRED

Delta Heating Corp., Trenton, N. J.
OverHead Heaters, Inc., Detroit, Mich.

HEATERS, ELECTRIC, OIL-HEATING, FOR PREVENTING FOAMING IN CRANKCASE COMPRESSOR OIL

Electro-Therm, Inc., Silver Spring, Md.
Heatube Corp., Allegan, Mich.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, FEEDWATER

See Deaerators

HEATERS, GASOLINE FIRED (FOR AIRCRAFT AND PORTABLE GROUND USE)

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
Devenco, Inc., Swingfire Div., New York.
Fluid Heat Div., Anchor Post Products Inc., Baltimore, Md.
Insto-Gas Corp., Detroit, Mich.
Perfection Stove Co., Cleveland, O.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Surface Combustion Corp., Toledo, O.

HEATERS, INDIRECT, SUBMERGED

American District Steam Co., Inc., North Tonawanda, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., Elyria, O.
Davis Engineering Corp., Elizabeth, N. J.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (quartz & graphite)
General Fittings Co., Providence, R. I.
General Heater & Regulators Co., East Chicago, Ind.
Gerstein & Cooper Co., Inc., South Boston, Mass.
Graham Mfg. Co., Inc., New York, N. Y.
Heatube Corp., Allegan, Mich.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Injector Co., Detroit, Mich.
Richmond Engineering Co., Inc., Richmond, Va.
Sims Co., Erie, Pa.
Superior Combustion Industries, Inc., Detroit, Mich.
Taco Heaters, Inc., Cranston, R. I.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters, Inc., New York, N. Y.

HEATERS, OIL

See Preheaters, Fuel Oil; Units, Fuel Oil, Heating, Pumping and Straining

HEATERS, RADIATION, FOR SUPPLYING HOT WATER RADIATION FROM STEAM BOILER

Alstrom Corp., New York, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Davis Engineering Corp., Elizabeth, N. J.
Lindy Heaters, Inc., New York, N. Y.

Thrush & Co., H. A., Peru, Ind.
Union Asbestos & Rubber Co., Chicago, Ill.

HEATERS, STEAM JET, FOR LIQUIDS

Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Duriron Co., Inc., The, Dayton, O.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Heil Process Equipment Corp., Cleveland, O.
O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
National Carbon Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Penberthy Injector Co., Detroit, Mich.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Sims Pump Valve Co., Hoboken, N. J.

HEATERS, STRIP AND IMMERSION, ELECTRIC

American Instrument Co., Inc., Silver Spring, Md.
Consolidated Metal Products Corp., Albany, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Electro-Therm, Inc., Silver Spring, Md.
Falcon Equipment Co., New Brighton, Pa.
Ferro Electric Products, Inc., Kirkland, Ill. (electric heating elements for room air conditioners)
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
Heil Process Equipment Corp., Cleveland, O.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Red Spot Electric Co., Tacoma, Wash.
Syntron Co., Homer City, Pa.
Titan Mfg. Co., Buffalo, N. Y.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, SUSPENDED, RADIANT, ELECTRIC

Berko Electric Mfg. Co., Queens Village, N. Y.
Electriglas Corp., Bergenfield, N. J.
Electromode Corp., Rochester, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
ThermoRay Corp., Irvington-On-Hudson, N. Y.
Trent, Inc., Philadelphia, Pa.
Union Chill Mat Co., Pittsburgh, Pa.
Vulcan Electric Co., Danvers, Mass.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, SUSPENDED, RADIANT, GAS FIRED

Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
Nat Corp., Kansas City, Mo.
Olson & Co., Arthur A., Canfield, O.
Power Engineering Co., Chicago, Ill.
Union Chill Mat Co., Pittsburgh, Pa.

HEATERS, UNIT, ELECTRIC HEATING ELEMENT

Electriglas Corp., Bergenfield, N. J.
Electromode Corp., Rochester, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Heatube Corp., Allegan, Mich.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Kilbury Mfg. Co., Inc., Lawndale, Calif.
Lintern Corp., Painesville, O.
Meco, Inc., Portland, Ore.
Norris-Thermador Corp., Los Angeles, Calif.
Palmer Mfg. Corp., Phoenix, Airz.
Red Spot Electric Co., Tacoma, Wash.
Royal Heaters, Inc., Alhambra, Calif.
Thermador Electrical Mfg., Los Angeles.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wing Mfg. Co., L. J., Linden, N. J.

HEATERS, UNIT, ELECTRIC HEATING ELEMENT, EXPLOSION PROOF

Electromode Corp., Rochester, N. Y.
Heatube Corp., Allegan, Mich.
Trent, Inc., Philadelphia, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

HEATERS, UNIT, GAS, PROPELLER FAN TYPE

Airtherm Mfg. Co., St. Louis, Mo.
Allan Engineering Co., Dallas, Tex.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Furnace Co., St. Louis, Mo.
Automatic Gas Equipment Co., Pittsburgh, Pa.
Barwick Mfg. Corp., Wichita, Kan.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Carrier Corp., Syracuse, N. Y.
Clow & Sons, James B., Chicago, Ill.
Coroaire Heater Corp., The, Cleveland, O.
Delta Heating Corp., Trenton, N. J.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Fedders-Quigan Corp., Buffalo, N. Y.
General Gas Light Co., Kalamazoo, Mich.
Grinnell Co., Inc., Providence, R. I.
Hastings Air Conditioning Co., Hastings, Neb.
Henry Furnace Co., The, Medina, O.
International Sales Co., San Francisco, Calif.
Ilg Electric Ventilating Co., Chicago, Ill.
Jackson & Church Co., Saginaw, Mich.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Mission Appliance Corp., Hawthorne, Calif.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Milwaukee, Wis.
Nat Corp., Kansas City, Mo.
National Radiator Co., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Norman Products Co., Inc., Columbus, O.
Ohio Foundry & Mfg. Co., Steubenville, O.
Olsen Mfg. Co., C. A., Elyria, O.
Payne Furnace Div., Affiliated Gas Equipment Inc., Monrovia, Calif.
Peerless Mfg. Corp., Louisville, Ky.
Reznor Mfg. Co., Mercer, Pa.
Roberts-Gordon Appliance Corp., Buffalo, N. Y.
Sonner Burner Co., Winfield, Kan.
Sterling Heat Specialties, Inc., Westfield, Mass.
Surface Combustion Corp., Toledo, O.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Utility Appliance Corp., Los Angeles, Calif.
Vacuum Gas Burner, Olean, N. Y.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Hyde Park, Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.
Young Radiator Co., Racine, Wis.
Zink Co., John, Tulsa, Okla.

HEATERS, UNIT, OIL, PROPELLER FAN TYPE

Delta Heating Corp., Trenton, N. J.

HEATERS, UNIT, STEAM AND HOT WATER, CABINET TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Thermal Industries, Inc., Detroit, Mich.
Brown Products Co., Forest Hills, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Dunham Co., C. A., Chicago, Ill.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Hastings Air Conditioning Co., Hastings, Neb.
McCord Corp., Detroit, Mich.
Modine Mfg. Co., Racine, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O.
Trane Co., The, La Crosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Young Radiator Corp., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, CENTRIFUGAL FAN TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Thermal Industries, Inc., Detroit.
Bayley Blower Co., Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Blazer, M. & Son, Passaic, N. J.
Brown Products Co., Forest Hills, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Dunham Co., C. A. Chicago, Ill.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Hastings Air Conditioning Co., Hastings, Neb.
Kennard Corp., St. Louis, Mo.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
Young Radiator Co., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, HORIZONTAL BLOW

Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Beacon-Morris Corp., Boston, Mass.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Buffalo, N. Y.
Grinnell Co., Inc., Providence, R. I.
Hartzell Propeller Fan Co., Piqua, O.
Ilg Electric Ventilating Co., Chicago, Ill.
King Co., The, Owatonna, Minn.
Kisco Boiler & Engineering Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Merchant & Evans Co., Philadelphia, Pa.
Modine Mfg. Co., Racine, Wis.
Muckle Mfg. Co., Owatonna, Minn.
Murray Mfg. Co., D. J., Wausau, Wis.
National Radiator Co., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Power Engineering Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Webster & Co., Warren, Camden, N. J.

Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wilson Engineering Corp., Chicago, Ill.
Wing Mfg. Co., L. J., Linden, N. J.
Young Radiator Co., Racine, Wis.

HEATERS, UNIT, STEAM AND HOT WATER, PROPELLER FAN TYPE, VERTICAL BLOW

Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Beacon-Morris Corp., Boston, Mass.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Burnham Corp., Irvington, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Buffalo, N. Y.
Gallaher Co., The Omaha, Neb.
Grinnell Co., Inc., Providence, R. I.
Johnson Corp., Three Rivers, Mich.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
National Radiator Co., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
New York Blower Co., Chicago, Ill.
Power Engineering Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Silco Products Inc., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Webster & Co., Warren, Camden, N. J.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.
Young Radiator Co., Racine, Wis.

HEATERS, VENTILATION

See Surface, Finned, Heating; Ventilators, Roof, Fan; Ventilators, Unit; Surface, Finned, Heating; Ventilators, Roof, Fan

HEATERS, WALL CIRCULATING, GAS FIRED

Central States Mfg. Co., Inc., Arkansas City, Kan.
Coroaire Heater Corp., The, Cleveland, Ohio
General Gas Light Co., Kalamazoo, Mich.
Mission Appliance Corp., Hawthorne, Calif.
Ohio Foundry & Mfg. Co., Steubenville, O.
Payne Furnace Div., Affiliated Gas Equipment Inc., Monrovia, Calif.
Peerless Mfg. Corp., Pittsburgh, Pa.
Royal Jet, Inc., Alhambra, Calif.
Stewart-Warner Corp., South Wind Div., Indianapolis, Ind.
Westinghouse Electric Corp., Sturtevant Div., Hyde Park, Boston, Mass.

HEATERS, WATER, AIR-TANKLESS

Tankless Water Heater and Compression Tank Combined

American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
General Fittings Co., Providence, R. I.
Taco Heaters, Inc., Cranston, R. I.

HEATERS, WATER, CAST IRON, COAL FIRED

Adams Co., The, Dubuque, Ia.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Burnham Corp., Irvington, N. Y.
Peerless Heater Co., The, Div. of The Eastern Foundry Co., Boyertown, Pa.
Prox Co., Inc., Frank, Terre Haute, Ind.
Smith Co., Inc., H. B., The, Westfield, Mass.
United States Radiator Corp., Detroit, Mich.
Weil-McLain Co., Michigan City, Ind.

HEATERS, WATER, ELECTRIC

Allcraft Mfg. Co., Cambridge, Mass.
Auburn Burner Co., Auburn, Ind.
Bastian-Morley Co., Inc., LaPorte, Ind.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Cleveland Heater Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Crane Co., Chicago, Ill.
Custom Engineering Co., Los Angeles, Calif.
Cutler-Hammer, Inc., Milwaukee, Wis.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Frigidaire Div., General Motors Corp., Dayton, O.
Hanson-Gates Mfg. Co., Inc., Reading, Mass.
Heatube Corp., Allegan, Mich.
Heat-X Inc., Brewster, N. Y.
Hotpoint Co., Chicago, Ill.
Hotstream Heater Co., Cleveland, O.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Livingstone Engineering Co., Worcester, Mass.
McGraw Electric Co., Clark Div., Chicago, Ill.
Mission Appliance Corp., Hawthorne, Calif.
National Steel Construction Co., Logansport, Ind.
Norris-Thermador Corp., Los Angeles, Calif.
Red Spot Electric Co., Tacoma, Wash.
Rheem Mfg. Co., Chicago, Ill.
Smith Corp., A. O., Milwaukee, Wis.
Thermador Electrical Mfg., Los Angeles, Calif.
Trent Inc., Philadelphia, Pa.
United States Radiator Corp., Detroit, Mich.
Viking Mfg. Corp., Cleveland, O.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wood Co., John, Conshohocken, Pa.
York-Shipley, Inc., York, Pa.

HEATERS, WATER, GAS FIRED

Aldrich Co., Wyoming, Ill.
Alstrom Corp., New York, N. Y.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Auburn Burner Co., Auburn, Ind.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bica Co., Girard, O.
Brown Products Co., Forest Hills, N. Y.
Bryan Steam Corp., Peru, Ind.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Clayton Mfg. Co., El Monte, Calif.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Cleaver-Brooks Co., Milwaukee, Wis.
Cleveland Heater Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Crane Co., Chicago, Ill.
Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
Delco Appliance Div., General Motors Corp., Rochester, N. Y.
Dewey-Shepard Boiler Co., Indianapolis, Ind.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Hanson-Gates Mfg. Co., Inc., Reading, Mass.
Heat Equipment, Not Inc., Chicago, Ill.
Hook & Ackerman, Inc., New York, N. Y.
Hotstream Heater Co., Cleveland, O.
Hydrotherm, Inc., Northvale, N. J.
Kehm Corp., The, Chicago, Ill.
McGraw Electric Co., Chicago, Ill.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
Mission Appliance Corp., Hawthorne, Calif.
Montgomery Bros., San Francisco, Calif.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
Mueller Climatrol, Milwaukee, Wis.
Mund Boilers, Inc., Los Angeles, Calif.
National Steel Construction Co., Logansport, Ind.
Norse Boiler Co., Inc., New Market, N. J.
Pacific Steel Boiler Div., United States Radiator Corp., Detroit, Mich.
Pittsburgh Water Heater Co., Pittsburgh, Pa.
Rheem Mfg. Co., Chicago, Ill
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
Riverside Boiler and Engineering Co., Ft. Worth, Tex.
Ruud Mfg. Co., Pittsburgh, Pa.
Schoedinger, Inc., F. O., Columbus, O.
Sellers Engineering Co., Chicago, Ill.
Servel, Inc., Evansville, Ind.
Smith Co., Inc., H. B., The, Westfield, Mass.
Smith Corp., A. O., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Sullivan Valve & Engineering Co., Butte, Mont.
Thermapanels, Inc., Santa Clara, Calif.
United States Radiator Corp., Detroit, Mich.
Viking Mfg. Corp., Cleveland, O.
Wood Co., John, Conshohocken, Pa.
York-Shipley, Inc., York, Pa.

HEATERS, WATER, INDIRECT

American District Steam Co., Inc., North Tonawanda, N. Y.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Davis Engineering Corp., Elizabeth, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Ferguson & Lange Foundry Co., Chicago, Ill.
General Fittings Co., Providence, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Graham Mfg. Co., Inc., New York, N. Y.
Hook & Ackerman, Inc., New York, N. Y.
Howard Iron Works & Alberger Heater Div., Buffalo, N. Y.
Hydrotherm, Inc., Northvale, N. J.
Kehm Corp., The, Chicago, Ill.
Lewis & Co., Joseph E., Baltimore, Md.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
National Radiator Co., The, Johnstown, Pa.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
Sellers Engineering Co., Chicago, Ill.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Weil-McLain Co., Michigan City, Ind.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters, Inc., New York, N. Y.

HEATERS, WATER, INDIRECT, COMBINATION TANK AND TANKLESS

American District Steam Co., Inc., North Tonawanda, N. Y.
American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Burnham Corp., Boiler Div., Irvington, N. Y.
Carpenter Heating & Stoker Co., Cleveland, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crotty Mfg. Corp., Long Island, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (quartz & graphite)
General Fittings Co., Providence, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Hook & Ackerman, Inc., New York, N. Y.
Howard Iron Works & Alberger Heater Div., Buffalo, N. Y.
Hydrotherm, Inc., Northvale, N. J.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Penberthy Injector Co., Detroit, Mich.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Richmond Engineering Co., Inc., Richmond, Va.
Sims Co., Erie, Pa.
Taco Heaters, Inc., Cranston, R. I.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters, Inc., New York, N. Y.

HEATERS, WATER, OIL FIRED

Air Devices, Inc., New York, N. Y.
Aldrich Co., Wyoming, Ill.
Alstrom Corp., New York, N. Y.
Auburn Burner Co., Auburn, Ind.
Bock Corp., Madison, Wis.
Brown Products Co., Forest Hills, N. Y.
Bryan Steam Corp., Peru, Ind.
Burnham Corp., Irvington, N. Y.
Century Engineering Corp., Cedar Rapids, Ia.
Clayton Mfg. Co., El Monte, Calif.
Cleaver-Brooks Co., Milwaukee, Wis.
Delta Heating Corp., Trenton, N. J.
Dewey-Shepard Boiler Co., Indianapolis, Ind.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Electrol Burner Mfg. Co., Inc., Rutherford, N. J.
Fitzgibbons Boiler Co., Inc., New York, N. Y.
Hanson-Gates Mfg. Co., Inc., Reading, Mass.
Heat Equipment, Not Inc., Chicago, Ill.
Hotstream Heater Co., Cleveland, O.
Johnson Co., S. T., Bridgeport, Pa.
Mt. Hawley Mfg. Co., Inc., Peoria, Ill.
Mueller Climatrol, Milwaukee, Wis.
Mund Boilers, Inc., Los Angeles, Calif.
National Steel Construction Co., Logansport, Ind.
Norse Boiler Co., Inc., New Market, N. J.
Nu-Way Corp., The, Rock Island, Ill.
Pacific Steel Boiler Div., United States Radiator Corp., Detroit, Mich.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Petro, 3170 W. 106th St., Cleveland, O.
Portmar Boiler Co., Inc., Brooklyn, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Ray Oil Burner Co., San Francisco, Calif.
Reif-Rexoil, Inc., Buffalo, N. Y.
Rheem Mfg. Co., Chicago, Ill.
Rite Engineering & Mfg. Corp., Los Angeles, Calif.
Shephard Heater Co., Inc., Terre Haute, Ind.
Smith Co., Inc., H. B., The, Westfield, Mass.
Sullivan Valve & Engineering Co., Butte, Mont.
United States Radiator Corp., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Viking Mfg. Corp., Cleveland, O.
Waterfilm Boilers, Inc., Jersey City, N. J.
Way-Wolff Assoc., Inc., New York, N. Y. (Marine)

HEATERS, WATER, STEAM, INSTANTANEOUS

Aerco Corp., Northvale, N. J.
Alstrom Corp., New York, N. Y.
American District Steam Co., Inc., North Tonawanda, N. Y.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
American Tube Products, Inc., Natick, R. I.
Bell & Gossett Co., Morton Grove, Ill.
Coe Mfg. Co., Painesville, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fitzgibbons Boiler Co., Inc., New York, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Fittings Co., Providence, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Gerstein & Cooper Co., Inc., South Boston, Mass.
Graham Mfg. Co., Inc., New York, N. Y.
Hasco Valve & Machine Co., Milwaukee, Wis.
Howard Iron Wks. & Alberger Heater Div., Buffalo, N. Y.
Johnson Corp., The, Three Rivers, Mich.
Kewanee-Ross Corp., Kewanee, Ill.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lewis & Co., Joseph E., Baltimore, Md.
Lindy Heaters, Inc., New York, N. Y.
Manning & Lewis Engineering Co., Newark, N. J.
Marion Machine Foundry & Supply Co., Marion, Ind.
Montgomery Bros., San Francisco, Calif.
National Pipe Bending Co., New Haven, Conn.
O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Pick Mfg. Co., West Bend, Wis. (direct steam injection)
Richmond Engineering Co., Inc., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Screw Machine Products Co., Portland, Ore.
Sims Co., Erie, Pa.
Superior Combustion Industries, Inc., New York, N. Y.
Swartwout Co., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters, Inc., New York, N. Y.

HEATERS, WATER, STEAM, STORAGE

Aerco Corp., Northvale, N. J.
Alstrom Corp., New York, N. Y.
American District Steam Co., Inc., North Tonawanda, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Birchfield Boiler, Inc., Tacoma, Wash.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Burnham Corp., Boiler Div., Irvington, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering Inc., Somerville, Mass.
Davis Engineering Corp., Elizabeth, N. J.
Fitzgibbons Boiler Co., Inc., New York, N. Y.
General Fittings Co., Providence, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Gerstein & Cooper Co., Inc., South Boston, Mass.
Hoppes Mfg. Co., Inc., Springfield, O.
Howard Iron Wks. & Alberger Heater Div., Buffalo, N. Y.
Johnson Corp., The, Three Rivers, Mich.
Kewanee-Ross Corp., Kewanee, Ill.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lindy Heaters, Inc., New York, N. Y.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Manning & Lewis Engineering Co., Newark, N. J.
Marion Machine Foundry & Supply Co., Marion, Ind.
National Pipe Bending Co., New Haven, Conn.
O'Brien Steam Specialty Co., Syracuse, N. Y. (open)
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Penberthy Injector Co., Detroit, Mich.
Quaker City Iron Works, Philadelphia, Pa.
Richmond Engineering Co., Inc., Richmond, Va.
Schaub Engineering Co., Fred H., Chicago.
Sims Co., Erie, Pa.
Stout & Sons, David, St. Louis, Mo.
Swartwout Co., The, Cleveland, O.
Taco Heaters, Inc. Cranston, R. I.
Tranter Mfg. Inc., Lansing, Mich.
Vogt Machine Co., Henry, Louisville, Ky.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., Hartford, Conn.
Yula Water Heaters Inc., New York, N. Y.

HEATERS, WATER, STEEL, COAL FIRED

Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Catskill Metal Works, Inc., Catskill, N. Y.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Fitzgibbons Boiler Co., Inc., New York, N. Y.
Johnston Bros., Inc., Ferrysburg, Mich.
Kewanee-Ross Corp., Kewanee, Ill.
Pacific Steel Boiler Div., United States Radiator Corp., Detroit, Mich.
Terre Haute Boiler Works, Co., Terre Haute, Ind.

HEATING BOILERS

See Boilers, Heating

HEATING COILS

See Surface, Heating

HEATING SURFACE

See Surface, Heating

HOODS, FUME DISPOSAL, LABORATORY

Atlas Mineral Products Co., Mertztown, Pa.
Kewaunee Mfg. Co., Adrian, Mich.
Sheldon Equipment Co., E. H., Muskegon, Mich.

HOISTS, PORTABLE, FOR INSTALLING HEATING, PIPING AND AIR CONDITIONING EQUIPMENT

Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Clipper Mfg. Co., Kansas City, Mo.
Coffing Hoist Co., Danville, Ill.
Detroit Hoist & Machine Co., Detroit, Mich.
Keller Tool Co., Grand Haven, Mich.
Lug-All Co., The, Wynnewood, Pa.

HOSE CLAMPS

See Clamps, Hose

HOSE, FLEXIBLE, AND FITTINGS

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
American Metal Hose Branch, The American Brass Co., Waterbury, Conn.
Ammerman Co., C. L., Minneapolis, Minn.
Atlantic Metal Hose Co., Inc., New York, N. Y.
Brockway Co., Naugatuck, Conn.
Chiksan Co., Brea, Calif.
DK Mfg. Co., Cobra Metal Hose Div., Chicago, Ill.
Dole Refrigerating Co., Chicago, Ill.
Everhot Products Co., Chicago, Ill.
Finn & Co., Inc., T. R., Hawthorne, N. J.
Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Flexible Tubing Corp., Guilford, Conn.
Flexonics Corp., Maywood, Ill.
Goodall Rubber Co., Trenton, N. J.
Imperial Brass Mfg. Co., Chicago, Ill.
International Metal Hose Co., Detroit, Mich.
Johnson Metal Hose, Inc., Waterbury, Conn.
Marquette Coppersmithing Co., Philadelphia, Pa.
Newage International, Inc., New York, N. Y.
Norgren Co., C. A., Englewood, Colo.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Perfecting Service Co., Charlotte, N. C.
Seamlex Co., Inc., Long Island City, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Titeflex, Inc., Newark, N. J.
United Metal Hose Co., Inc., Long Island City, N. Y.
Universal Metal Hose Co., Chicago, Ill.
Vibration Mounting, Inc., Elmhurst, N. Y.
Weatherhead Co., The, Cleveland, O.
Yardley Plastics Co., Columbus, O.
Zallea Brothers, Wilmington, Del.

HOSE, NON-METAL, AND FITTINGS

Aero-Coupling Corp., Burbank, Calif.
Aeroquip Corp., Jackson, Mich.
Ammerman Co., C. L., Minneapolis, Minn.
Anchor Packing Co., Philadelphia, Pa.
Arrowhead Rubber Co., Long Beach, Calif.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Continental Rubber Works, Erie, Pa.
De Vilbiss Co., The, Toledo, O.
Flexaust Co., New York, N. Y.
Flexible Tubing Corp., Guilford, Conn.
Gates Rubber Co., The, Denver, Colo.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Henry Valve Co., Melrose Park, Ill.
Hewitt-Robins Inc., Hewitt Rubber Div., Buffalo, N. Y.
New York Belting & Packing Co., Passaic, N. J.

Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber and Tire Corp., Youngstown, O.
Resistoflex Corp., Belleville, N. J.
Roylyn, Inc., Glendale, Calif.
Snap-Tite, Inc., Union City, Pa.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Thermoid Co., Trenton, N. J.
Thor Power Tool Co., Aurora, Ill.
United States Rubber Co., New York, N. Y.
Vibration Mounting, Inc., Elmhurst, N. Y.
Weatherhead Co., The, Cleveland, O.

HOSE, VENTILATING

See Ducts and Duct Fittings, Prefabricated, Non-Metallic

HOSPITAL OPERATING ROOM AIR CONDITIONING UNITS

See Units, Air Conditioning, Exclusively for Hospital Operating Rooms

HOT GAS DEFROSTING

See Systems, Hot Gas Defrosting for Refrigeration

HOT WATER HEATING SYSTEMS

See Systems, Heating, Hot Water

HOT WATER HEATING SYSTEMS, BALANCING ELBOWS FOR

See Elbows, Balancing, For Hot Water Heating System

HOT WATER PRESSURE REGULATORS

See Regulators, Pressure, Hot Water Heating Systems

HOUSINGS, FAN, CENTRIFUGAL

(Housing only—not complete fans)

Ammerman Co., C. L., Minneapolis, Minn.
Barry Blower Co., Minneapolis, Minn.
Bishop & Babcock Mfg. Co., Cleveland, O.
Brookside Products Co., Inc., McCordsville, Ind.
Brundage Co., The, Kalamazoo, Mich.
Champion Blower & Forge Co., Lancaster, Pa.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Clarage Fan Co., Kalamazoo, Mich.
Commercial Shearing & Stamping Co., Youngstown, O.
Detroit Stamping Co., Detroit, Mich.
General Blower Co., Morton Grove, Ill.
Hastings Air Conditioning Co., Hastings, Neb.
Haveg Corp., Newark, Del. (plastic for corrosive fumes)
Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago, Ill.
Maysteel Products, Inc., Milwaukee, Wis.
Morrison Products Inc., Cleveland, O.
Northern Blower Co., Cleveland, O.
Palmer Mfg. Corp., Phoenix, Ariz.
Revcor, Carpentersville, Ill.
Schwitzer-Cummins Co., Indianapolis, Ind.
Torit Mfg. Co., St. Paul, Minn.
United States Air Conditioning Corp., Minneapolis, Minn.
Utica Products, Inc., Utica, N. Y.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.

HOUSINGS, FAN, PROPELLER

(Housing only—not complete fans)

Allen Cooler & Ventilator, Inc., Rochester, Mich.
Ammerman Co., C. L., Minneapolis, Minn.
Barnes Co., A. D., Dayton, O.
Brookside Products Co., Inc., McCordsville, Ind.
Chicago Blower Corp., Franklin Park, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Commercial Shearing & Stamping Co., Youngstown, O.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
General Blower Co., Morton Grove, Ill.
Haveg Corp., Newark, Del. (plastic for corrosive fumes)
International Engineering, Inc., Dayton, O.
Martin Fan & Blower Co., Chicago, Ill.
Palmer Mfg. Corp., Phoenix, Ariz.
Schwitzer-Cummins Co., Indianapolis, Ind.

HUMIDIFIERS, CENTRAL PLANT

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
American Blower Corp., Detroit, Mich.
American Foundry & Furnace Co., Bloomington, Ill.
American Moistening Co., Providence, R. I.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Armstrong Machine Wks., Three Rivers, Mich.
Bahnson Co., Winston-Salem, N. C.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Clarage Fan Co., Kalamazoo, Mich.
Cleveland Humidifier Co., Cleveland, O.
Daffin Mfg. Co., Lancaster, Pa.
Farr Co., Los Angeles, Calif.
Flight Mfg. Corp., Camden, N. J.
Grinnell Co., Inc., Providence, R. I.
Johnson Service Co., Milwaukee, Wis.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla. (vaporizers for humidifiers)
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
National Air Conditioning Inc., Johnstown, Pa.
National Engineering & Mfg. Co., Kansas City, Mo.
Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Powers Regulator Co., Skokie, Ill.
Research Products Corp., Madison, Wis.
Roberson Co., L. N., Seattle, Wash.
Surface Combustion Corp., Toledo, O.
Trane Co., The, LaCrosse, Wis.
Vilter Mfg. Co., Milwaukee, Wis.
Water Cooling Corp., New York, N. Y.
York Corp., York, Pa.

HUMIDIFIERS, DIRECT, SPRAY HEAD

Abbeon Supply Co., Jamaica, N. Y.
American Moistening Co., Providence, R. I.
Anetsberger Bros., Inc., Northbrook, Ill.
Bahnson Co., Winston-Salem, N. C. (Centrifugal)
Binks Mfg. Co., Chicago, Ill.
Buffalo Forge Co., Buffalo, N. Y.
Daffin Mfg. Co., Lancaster, Pa.
Drying Systems, Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Maid-O'-Mist, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
Murray Mfg. Co., D. J., Wausau, Wis.
Paasche Airbrush Co., Chicago, Ill.
Parks-Cramer Co., Fitchburg, Mass.
Pfening Co., Fred D., Columbus, O.
Rhode Island Humidifier & Ventilating Co., Boston, Mass.
Roberson Co., L. N., Seattle, Wash.
Ross Sprinkler Co., Rosemead, Calif.
Somers, Inc., H. J., Detroit, Mich.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Supreme Electric Products Corp., Rochester, N. Y.
Walton Laboratories, Inc., Irvington, N. J.
Water Cooling Corp., New York, N. Y.

HUMIDIFIERS FOR RADIATORS AND CONVECTORS

Kauffman Air Conditioning Corp., St. Louis, Mo.
Maid-O'-Mist, Inc., Chicago, Ill.
Skilbeck Mfg. Co., Kenosha, Wis.

HUMIDIFIERS, RADIATOR VENT VALVE

G & H Mfg. Co., Philadelphia, Pa.
Maid-O'-Mist, Inc., Chicago, Ill.
Skilbeck Mfg. Co., Kenosha, Wis.

HUMIDIFIERS, UNIT, ROOM TYPE (Without Heating)

Abbeon Supply Co., Jamaica, N. Y.
American Moistening Co., Providence, R. I.
Armstrong Machine Wks., Three Rivers, Mich.
Bahnson Co., Winston-Salem, N. C.
Crowell & Dunn, Inc., New York, N. Y.
Daffin Mfg. Co., Lancaster, Pa.
Flight Mfg. Corp., Camden, N. J. (with electric heating unit)
Fresh'nd-Aire Co., Div. of Cory Corp., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Health Trola Div., Excel Heating & Air Conditioning Co., Chicago, Ill.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Murray Mfg. Co., D. J., Wausau, Wis.
National Engineering & Mfg. Co., Kansas City, Mo.
Palmer Mfg. Corp., Phoenix, Ariz.
Somers, Inc., H. J., Detroit, Mich.
Spraying Systems Co., Bellwood, Ill.
Standard Engineering Wks., Pawtucket, R. I.
Tempmaster Corp., Kansas City, Mo.
Walton Laboratories, Inc., Irvington, N. J
Water Cooling Corp., New York, N. Y.

HUMIDIFYING RADIATORS

See Radiators, Humidifying

HUMIDISTATS

Abbeon Supply Co., Jamaica, N. Y.
American Instrument Co., Silver Spring, Md.
American Moistening Co., Providence, R. I.
Bahnson Co., Winston-Salem, N. C.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Parks-Cramer Co., Fitchburg, Mass.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Standard Engineering Wks., Pawtucket, R. I.
Walton Laboratories, Inc., Irvington, N. J.

HUMIDITY INDICATORS

See Indicator-Controllers, Relative Humidity; Psychrometers

HUMIDITY RECORDERS

See Recorders, Humidity

HUMIDITY AND TEMPERATURE CONTROLS

See Humidistats; Recorder-Controllers; Thermostats

HYDRAULIC PIPE PUSHERS

See Pushers, Pipe, Hydraulic

HYDRAULIC SPEED CHANGERS

See Changers, Speed, Hydraulic Coupling

HYGROMETERS

Airguide Instrument Co., Chicago, Ill.
Airserco Mfg. Co., Pittsburgh, Pa.
American Instrument Co., Inc., Silver Spring, Md.
American Moistening Co., Providence, R. I.
Bristol Co., The, Waterbury, Conn.
Daigger & Co., A., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Scientific Equipment Co., Philadelphia, Pa.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.

Weston Electrical Instrument Corp., Newark, N. J.
Will Corp., Rochester, N. Y.

HYGROSTATS
See Humidistats

IDENTIFICATION MARKERS (For Piping Services)
Brady Co., W. H., Milwaukee, Wis.
Seton Name Plate Co., New Haven, Conn.
Western Lithograph Co., Los Angeles, Calif.
Wilmington Plastics, Inc., Wilmington, Del.

IMMERSION THERMOSTATS
See Thermostats, Immersion

INCINERATORS, FOR LARGE BUILDINGS
Gober Incinerator Corp., Chicago, Ill.
Henriksen Co., C. O., Chicago, Ill.
Incinerator Products Co., Detroit, Mich.
Nichols Engineering & Research Corp., New York, N. Y.
Plibrico Co., Chicago, Ill.

INDICATING THERMOMETERS
See Thermometers, Indicating

INDICATOR-CONTROLLERS, PRESSURE
Automatic Control Co., St. Paul, Minn.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Control Engineering Corp., Controls Div., Norwood, Mass.
Cooper Co., Clark, Palmyra, N. J.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Dickson Co., The, Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Giannini & Co., Inc., G. M., Pasadena, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

INDICATOR-CONTROLLERS, RELATIVE HUMIDITY
American Instrument Co., Inc., Silver Spring, Md.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

INDICATOR-CONTROLLERS, TEMPERATURE
American Instrument Co., Inc., Silver Spring, Md.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Cooper Co., Clark, Palmyra, N. J.
Cybertronic Corp. of America, Chester, Pa.
Dickson Co., The, Chicago, Ill.
Fenwal, Inc., Ashland, Mass.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Illinois Testing Laboratories, Inc., Chicago.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Pyrometer Instrument Co., Inc., The, Bergenfield, N. J.
Sarco Co., Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Smith Control & Instrument Corp., Palmyra, N. J.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Wiegand Co., Edwin L., Pittsburgh, Pa.

INDICATORS, CARBON DIOXIDE, BOILER ROOM
For Portable CO_2 Analyzers, See Analyzers, Carbon Dioxide, Portable

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Defender Instrument and Regulator Co., St. Louis, Mo.
Engelhard, Inc., Chas., Newark, N. J.
Ess Instrument Co., Bergenfield, N. J.
General Scientific Equipment Co., Philadelphia, Pa.
Hays Corp., Michigan City, Ind.
Permutit Co., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill.
Standard Instrument Corp., New York, N. Y.
Uehling Instrument Co., Paterson, N. J.

INDICATORS, DEW POINT
American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Illinois Testing Laboratories, Inc., Chicago.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Pittsburgh Lectrodryer Corp., Pittsburgh, Pa.

INDICATORS, FLOW
See Meters, Flow

INDICATORS, LIQUID LEVEL, BOILER AND TANK
Automatic Control Co., St. Paul, Minn.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Boston Auto Gage Co., Pittsfield, Mass.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Cochrane Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Daytronic Corp., Dayton, O.
Defender Instrument & Regulator Co., St. Louis, Mo.
Detroit Brass & Malleable Co., Detroit, Mich.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Frick Co., Waynesboro, Pa.
Gasoilair Equipment Co., New Haven, Conn.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Liquidepth Indicators, Inc., Long Island City, N. Y.
Magnetrol, Inc., Chicago, Ill.
Mason-Neilan Regulator Co., Boston, Mass.
McDonnell & Miller, Inc., Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Newark Controls Co., Bloomfield, N. J.
Penberthy Injector Co., Detroit, Mich.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Reliance Gauge Column Co., Cleveland, O.
Ripley Co., Inc., Middletown, Conn.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Swift Lubricator Co., Inc., Elmira, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Techniflex Corp., Port Jervis, N. Y.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Yarnall-Waring Co., Philadelphia, Pa.

INDICATORS, pH
American Instrument Co., Inc., Silver Spring, Md.
Analytical Measurements, Inc., Chatham, N. J.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Leeds & Northrup Co., Philadelphia, Pa.
Madden Corp., The, Chicago, Ill.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Photovolt Corp., New York, N. Y.
Thomas Co., Arthur H., Philadelphia, Pa.
Thwing-Albert Instrument Co., Philadelphia.

INDICATORS, RELATIVE HUMIDITY
Abbeon Supply Co., Jamaica, N. Y.
Airguide Instrument Co., Chicago, Ill.
American Instrument Co., Inc., Silver Spring, Md.
American Moistening Co., Providence, R. I.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine & Metals, Inc., Sellersville, Pa.
Walton Laboratories, Inc., Irvington, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

INDICATORS, SOUND LEVEL
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Hermon Hosmer Scott, Inc., Cambridge, Mass.

INDIRECT HEATING SURFACE
See Surface, Heating

INDIRECT WATER HEATERS
See Heaters, Water, Indirect

INDUSTRIAL AIR CONDITIONERS
See Units, Air Conditioning, Industrial Type

INDUSTRIAL DRYERS
See Dryers, Industrial

INJECTOR RECIRCULATORS FOR REFRIGERANTS
Phillips & Co., H. A., Chicago, Ill.

INSERTS, CONCRETE
Air-Path Products Co., Baltimore, Md.
Carty & Moore Engineering Co., Detroit, Mich.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Healy Ruff Co., St. Paul, Minn.
Hupp Corp., Globe Stamping Div., Cleveland, O.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Truscon Steel Div., Republic Steel Corp., Youngstown, O.
Unistrut Products Co., Chicago, Ill.

INSTANTANEOUS WATER HEATERS
See Heaters, Water, Steam, Instantaneous

INSULATING CONCRETE
See Concrete, Insulating

INSULATION ANCHORS AND ADHESIVES
See Fasteners, Insulation

INSULATION, BOILER AND TANK
Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa. (85% Magnesia)
Asbestos Asphalt Insulation Co., Chicago, Ill.
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Hill Co., Trenton, N. J. (Rock wool)
Bigelow Liptak Corp., Detroit, Mich.
Bird-Archer Co., Philadelphia, Pa.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chicago Fire Brick Co., Chicago, Ill.
Columbia Acoustics & Fireproofing Co., Stanhope, N. J.
Eagle-Picher Co., Cincinnati, O.
Ehret Magnesia Mfg. Co., Valley Forge, Pa. (Magnesia)
Forty-Eight Insulations, Inc., Aurora, Ill.
Glass Fibers, Inc., Toledo, O.
Grant Wilson Inc., Chicago, Ill.
Green Fire Brick Co., Mexico, Mo.
Insul-Mastic Corp., Pittsburgh, Pa.
International Vermiculite Co., Girard, Ill.
Johns-Manville, New York, N. Y.
Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
Keasbey Co., Robert A., New York, N. Y. (Asbestos)
Keasbey & Mattison Co., Ambler, Pa.
Krehbiel Co., J. H., Chicago, Ill.
Laclede-Christy Co., St. Louis, Mo.
Libbey-Owens-Ford Glass Co., Toledo, O.
Lockport Mills, Inc., Lockport, N. Y.
Monsanto Chemical Co., Merimac Div., Boston, Mass.
Mundet Cork Corp., North Bergen, N. J. (Cork)
Munn and Steele, Inc., South Boston, Mass.
National Cork Co., Englewood, N. J. (Corkboard)
National Gypsum Co., Buffalo, N. Y. (Rock wool)
Norristown Magnesia & Asbestos Co., Norristown, Pa. (Asbestos and magnesia)
Owens-Corning Fiberglas Corp., Toledo, O. (block or board)
Pabco Products Inc., San Francisco, Calif.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Palladium Mastic Corp. of America, Rutherford, N. J.
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Plibrico Co., Chicago, Ill.
Poe Co., C. W., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Reflectal Corp., Subsidiary, Borg-Warner Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y. (Blanket, block, cement)
Robinson Industries, Coleman, Mich. (expanded plastic)
Ruberoid Co., New York, N. Y. (Asbestos, magnesia)
Sall Mountain Co., Hamilton, O.
Schundler & Co., Inc., F. E., Long Island City, N. Y.
Smith & Kanzler Corp., Linden, N. J.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill.
Standard Fuel Engineering Co., Detroit, Mich.
Telsit Insulation Co., Bronx, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United Cork Co., Kearney, N. J. (Cork)
United States Mineral Wool Co., Stanhope, N. J.
Walker Jamar Co., Duluth, Minn.
Western Mineral Products Co., Minneapolis, Minn.
Zonolite Co., Chicago, Ill. (plastic)

INSULATION, BUILDING
Acme Asbestos Covering & Flooring Co., Chicago, Ill. (Rock wool)
American Flange & Mfg. Co., Inc., New York, N. Y. (Metal sheets)
Armstrong Cork Co., Lancaster, Pa. (Corkboard, fibre board)
Bache & Co., Semon, New York, N. Y. (Glass wool)
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Hill Co., Trenton, N. J. (Rock wool)
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Rock wool)
Carney Co., Inc., The, Mankato, Minn.
Celotex Corp., The, Chicago, Ill.
Certain-teed Products Corp., Ardmore, Pa.
Chamberlin Co. of America, Detroit, Mich.
Columbia Acoustics & Fireproofing Co., Stanhope, N. J.
Cork Insulation Co., Inc., New York, N. Y. (Corkboard)
Dodge Cork Co., Inc., Lancaster, Pa.
Eagle-Picher Co., Cincinnati, O. (Mineral wool, blankets, batts, granulated, loose)
Fir-tex Insulating Board Co., St. Helens, Ore. (Wood fibre-board)
Flintkote Co., The, New York, N. Y.
Forty-Eight Insulations, Inc., Aurora, Ill.
General Insulating Products Co., Brooklyn, N. Y. (Rock wool)
Glass Fibers, Inc., Toledo, O.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Hogan & Co., Inc., C. T., New York, N. Y. (reflective)
Infra Insulation, Inc., New York, N. Y. (reflective)
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn. (Wool fibre)
International Insulations, Inc., New York, N. Y.
International Vermiculite Co., Girard, Ill. (Loose fill)
Isoflex Corp., Redwood City, Calif.
Johns-Manville, New York, N. Y. (Rock wool and wood fibre-board)
Johnston Foil Mfg. Co., St. Louis, Mo. (Foil, aluminum, tin, lead)
Kimberly-Clark Corp., Neenah, Wis.
Libbey-Owens-Ford Glass Co., Toledo, O.
Lockport Mills, Inc., Lockport, N. Y.
Mineral Insulation Co., Chicago Ridge, Ill. (Rock wool)
Miracle Adhesives Corp., New York, N. Y. (vapor barrier material)
Multi-Cell Sales Corp., Minneapolis, Minn. (Blanket, quilted newspaper)
Munn & Steele, Inc., South Boston, Mass.
National Cork Co., Englewood, N. J. (Corkboard)
National Gypsum Co., Buffalo, N. Y.
Nelson Mfg. Co., B. F., Minneapolis, Minn.
Owens-Corning Fiberglas Corp., Toledo, O.
Pacific Lumber Co., The, San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Plastergon Wall Board Co., Buffalo, N. Y. (Rigid board)
Poe Co., C. W., Cleveland, O.
Rector Mineral Trading Corp., New York, N. Y.
Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y. (Rock, slag wool)
Reynolds Metals Co., Louisville, Ky.
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Ruberoid Co., New York, N. Y.
Silvercote Products, Inc., Chicago, Ill.
Sprayo-Flake Co., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill. (Asbestos, hairfelt)
Tectum Corp., Newark, O. (insulated roof deck)
Tennessee Products and Chemical Corp., Nashville, Tenn.
United Cork Companies, Kearny, N. J. (Cork)
United States Gypsum Co., Chicago, Ill. (Wool and board)
United States Mineral Wool Co., Stanhope, N. J. (Mineral wool)
Western Mineral Products Co., Minneapolis, Minn.
Wilson & Co., Inc., Chicago, Ill. (Board)
Wood Conversion Co., St. Paul, Minn.
Zonolite Co., Chicago, Ill. (Loose fill)

INSULATION, DUCT, SOUND DEADENING
For Application Inside Duct
American Hair & Felt Co., Chicago, Ill.
Baldwin-Hill Co., Trenton, N. J.
Celotex Corp., The, Chicago, Ill.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Felters Company, The, Boston, Mass.
Flintkote Co., The, New York, N. Y.
Glass Fibers, Inc., Toledo, O.
Grant Wilson, Inc., Chicago, Ill.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Industrial Acoustics Co., New York, N. Y.
Industrial Sound Control, Inc., Hartford, Conn. (packaged unit to incorporate in duct work for quieting air and noise)
Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.
International Insulations, Inc., New York, N. Y.
Johns-Manville, New York, N. Y.
Keasbey Co., Robert A., New York, N. Y.
Lockport Mills, Inc., Lockport, N. Y.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Mortell Co., J. W., Kankakee, Ill.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Owens-Corning Fiberglas Corp., Toledo, O.
Sprayo-Flake Co., Chicago, Ill.
Telsit Insulation Co., Bronx, N. Y.
Thompson and Co., Oakmont, Pa.
United States Rubber Co., New York, N. Y.
Western Felt Works, Chicago, Ill.
Zonolite Co., Chicago, Ill.

INSULATION, DUCT, THERMAL
Acme Asbestos Covering & Flooring Co., Chicago, Ill. (Asbestos)
American Flange & Mfg. Co., Inc., New York, N. Y.
American Hair & Felt Co., Chicago, Ill. (Hair felt)
Armstrong Cork Co., Lancaster, Pa. (Corkboard)
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Hill Co., Trenton, N. J.
Bigelow Liptak Corp., Detroit, Mich.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asbestos)
Celotex Corp., The, Chicago, Ill.
Columbia Acoustics & Fireproofing Co., Stanhope, N. J.
Cork Insulation Co., Inc., New York, N. Y. (Corkboard)
Eagle-Picher Co., Cincinnati, O. (Mineral wool blankets)
Ehret Magnesia Mfg. Co., Valley Forge, Pa. (Cork, magnesia, hair felt)
Felters Company, The, Boston, Mass. (Wool felt)

Flintkote Co., The, New York, N. Y. (fibrated, asphalt spray-On)
Forty-Eight Insulations, Inc., Aurora, Ill.
General Insulating Products Co., Brooklyn, N. Y. (Acoustic rock wool)
Glass Fibers, Inc., Toledo, O.
Grant Wilson Inc., Chicago, Ill.
Gustin-Bacon Mfg. Co., Kansas City, Mo.
Hinde & Dauch Paper Co., Sandusky, O.
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa.
Infra Insulation, Inc., New York, N. Y.
Insulite Div. Minnesota and Ontario Paper Co., Minneapolis, Minn. (Wood fibre)
International Insulations, Inc., New York, N. Y.
International Vermiculite Co., Girard, Ill. (Block)
Isoflex Corp., Redwood City, Calif.
Insul-Mastic Corp., Pittsburgh, Pa.
Johns-Manville, New York, N. Y. (Rock cork, asbestos)
Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
Keasbey Co., Robert A., New York, N. Y. (Asbestos and cork)
Keasbey & Mattison Co., Ambler, Pa. (Asbestos)
Libbey-Owens-Ford Glass Co., Toledo, O.
Lockport Mills, Inc., Lockport, N. Y.
Mineral Insulation Co., Chicago Ridge, Ill. (Rock wool)
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Miracle Adhesives Corp., New York, N. Y. (prefabricated polyvinyl duct covering)
Mortell Co., J. W., Kankakee, Ill.
Mundet Cork Corp., North Bergen, N. J. (Cork)
Munn and Steele, Inc., South Boston, Mass.
National Cork Co., Englewood, N. J. (Corkboard)
Norristown Magnesia & Asbestos Co., Norristown, Pa. (Asbestos and wool felt)
Owens-Corning Fiberglas Corp., Toledo, O. (Blanket)
Pabco Products Inc., San Francisco, Calif.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Poe Co., C. W., Cleveland, O.
Quigley Co., Inc., New York, N. Y.
Rector Mineral Trading Corp., New York, N. Y.
Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y. (Block, blanket)
Reynolds Metals Co., Louisville, Ky.
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Ruberoid Co., New York, N. Y. (Asbestos cellular and laminated sheets or blocks)
Sall Mountain Co., Hamilton, O. (Asbestos)
Schundler & Co., Inc., F. E., Long Island City, N. Y.
Smith & Kanzler Corp., Linden, N. J. (Asbestos air cell type)
Sprayo-Flake Co., Chicago, Ill.
Spring Packing Corp., Chicago, Ill.
Standard Asbestos Mfg. Co., Chicago, Ill. (Asbestos, hair felt)
Telsit Insulation Co., Bronx, N. Y.
United Cork Companies, Kearny, N. J. (Cork)
United States Mineral Wool Co., Stanhope, N. J.
Western Felt Wks., Chicago, Ill. (Felt)
Wilson & Co., Inc., Chicago, Ill.
Zonolite Co., Chicago, Ill. (plastic)

INSULATION FASTENERS AND ANCHORS

See Fasteners, Insulation

INSULATION, FINISHING CEMENT

Baldwin-Hill Co., Trenton, N. J.
Bigelow Liptak Corp., Detroit, Mich.
Carey Mfg. Co., Philip, Cincinnati, O.
Chicago Fire Brick Co., Chicago, Ill.
Columbia Acoustics & Fireproofing Co., Stanhope, N. J.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Forty-Eight Insulations, Inc., Aurora, Ill.
Grant Wilson, Inc., Chicago, Ill.
Johns-Manville, New York, N. Y.
Keasbey Co., Robert A., New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Moore Inc., Goodloe E., Danville, Ill.
Mundet Cork Corp., N. Bergen, N. J. (mineral wool)
Ruberoid Co., New York, N. Y.
Sall Mountain Co., Hamilton, O. (asbestos)
Standard Asbestos Mfg. Co., Chicago, Ill.

INSULATION, PIPE

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
American Gilsonite Co., Salt Lake City, Utah (hot, underground)
American Hair & Felt Co., Chicago, Ill.
Armstrong Cork Co., Lancaster, Pa. (Cork, 85% mag, air cell, Hy-Temp.)
Asbestos Asphalt Insulation Co., Chicago, Ill.
Atlas Mineral Products Co., Mertztown, Pa.
Badham Insulation Co., Inc., Birmingham, Ala.
Baldwin-Hill Co., Trenton, N. J. (Rock wool)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Asbestos, magnesia)
Columbia Acoustics & Fireproofing Co., Stanhope, N. J.
Cork Insulation Co., New York, N. Y. (cork)
Durant Insulated Pipe Co., Palo Alto, Calif. (Underground)
Durant International Corp., Williamstown, N. J. (underground)
Eagle-Picher Co., Cincinnati, O. (Mineral wool)
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Forty-Eight Insulations, Inc., Aurora, Ill.
Glass Fibers, Inc., Toledo, O. (glass fiber)
Grant Wilson Inc., Chicago, Ill. (85% magnesium, air-cell, woolfelt, anti-sweat, frost proof, sponge felt.)
Gustin-Bacon Mfg. Co., Kansas City, Mo. (Molded fine glass fiber)
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa. (reflective)
Infra Insulation, Inc., New York, N. Y.
Insul-Mastic Corp., Pittsburgh, Pa. (asphalt-cork)
International Vermiculite Co., Girard, Ill. (Vermiculite)
Johns-Manville, New York, N. Y. (Asbestos, magnesia, rock cork)
Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
Keasbey Co., Robert A., New York, N. Y. (Asbestos and cork)
Keasbey & Mattison Co., Ambler, Pa. (Asbestos, magnesia)
Lockport Mills, Inc., Lockport, N. Y.
Lynch Asbestos Co., Los Angeles, Calif.
M M M, Inc., Houston, Tex. (low temperature)
Minnesota Mining & Mfg. Co., St. Paul, Minn. (Spray)
Miracle Adhesives Corp., New York, N. Y. (prefabricated polyvinyl pipe covering finish)
Mortell Co., J. W., Kankakee, Ill. (plastic cork)
Mundet Cork Corp., North Bergen, N. J. (Cork)
Munn and Steele, Inc., South Boston, Mass.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
National Cork Co., Englewood, N. J. (Corkboard)
National Gypsum Co., Buffalo, N. Y. (Moulded)
Norristown Magnesia & Asbestos Co., Norristown, Pa. (Asbestos, magnesia)
Owens-Corning Fiberglas Corp., Toledo, O.
Pabco Products Inc., San Francisco, Calif.
Pacific States Felt Mfg. Co., Inc., San Francisco, Calif.
Pittsburgh Corning Corp., Pittsburgh, Pa. (cellular glass)
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Poe Co., C. W., Cleveland, O.
Porter & Co., Inc., H. W., Newark, N. J. (Underground)
Presstite Engineering Co., St. Louis, Mo.
Reflectal Corp., Subsid. Borg-Warner Corp., Chicago, Ill (foil and corrugated paper)
Ric-wiL Co., Barberton, O.
Robinson Industries, Coleman, Mich. (expanded plastic)
Ruberoid Co., New York, N. Y. (Asbestos, magnesia, calsilite)
Sall Mountain Co., Hamilton, O. (Asbestos and wool felt)
Smith & Kanzler Corp., Linden, N. J. (Asbestos air cell, wool felt and hair felt)
Sponge Rubber Products Co., The, Shelton, Conn. (cellular rubber)
Spring Packing Corp., Chicago, Ill. (asphaltic)
Standard Asbestos Mfg. Co., Chicago, Ill.
Union Asbestos & Rubber Co., Chicago, Ill.
United Cork Companies, Kearny, N. J.
Virginia Smelting Co., West Norfolk, Va.
Walker Jamar Co., Duluth, Minn.
Western Mineral Products Co., Minneapolis, Minn. (Underground)
Wilson & Co., Chicago, Ill. (hairfelt)
Wood Conversion Co., St. Paul, Minn.
Wrap-On Co., Chicago, Ill. (Glass fiber and flexible tape)
Zonolite Co., Chicago, Ill. (underground)

INTAKES FOR OUTDOOR AIR, WALL OR ROOF, EQUIPPED WITH FILTERS

Muckle Mfg. Co., Owatonna, Minn.

IONIZATION APPARATUS

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Ozone Corp., Chicago, Ill.
Montgomery Bros., San Francisco, Calif.
United States Ozone Co. of America, Scottdale, Pa.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.
Welsbach Corp., The, Ozone Processes Div., Philadelphia, Pa.
Wesix Electric Heater Co., San Francisco, Calif.

IRON BODY VALVES

See Valves, Gate; and Valves, Globe

JACKETED PIPE

See Pipe, Jacketed

JACKETING FOR PIPE INSULATION

See Protectors, Pipe Covering

JETS, OVERFIRE AIR, FOR SMOKE ABATEMENT

Canton Stoker Corp., Canton, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
North American Mfg. Co., Cleveland, O.
Power Engineering Co., Chicago, Ill.
Reintjes Co., Geo. P., Kansas City, Mo.
Sterns-Flinn Corp., New York, N. Y.

JOINTS, PIPE, ELECTRICAL INSULATING

American Hard Rubber Co., New York, N. Y.
Barco Mfg. Co., Barrington, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Universal Controls Corp., Dallas, Tex.

JOINTS, PIPE, EXPANSION, PACKLESS

American District Steam Co., Inc., North Tonawanda, N. Y.
Badger Fire Extinguisher Co., Somerville, Mass.
Badger Mfg. Co., Cambridge, Mass. (Corrugated copper, stainless steel)
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Cook Electric Co., Chicago, Ill.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Flexonics Corp., Maywood, Ill.
Foster Wheeler Corp., New York, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Garlock Packing Co., Palmyra, N. Y. (rubber)
Goodall Rubber Co., Trenton, N. J.
Kopperman & Sons, Joseph, Philadelphia, Pa.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Marquette Coppersmithing Co., Philadelphia, Pa.
National Valve & Mfg. Co., Pittsburgh, Pa.
Northern Indiana Brass Co., Elkhart, Ind.
Ric-wiL Co., The, Barberton, O.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Solar Aircraft Co., San Diego, Calif.
Techniflex Corp., Port Jervis, N. Y.
United States Rubber Co., New York, N. Y.
Webster & Co., Warren, Camden, N. J.
Zallea Brothers, Wilmington, Del.

JOINTS, PIPE, EXPANSION, SLIP

American District Steam Co., Inc., North Tonawanda, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Clow & Sons, James B., Chicago, Ill.
Crane Co., Chicago, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Howard Iron Works & Alberger Heater Div., Buffalo, N. Y.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Moran Flexible Joint Co., Louisville, Ky.
Northern Indiana Brass Co., Elkhart, Ind.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Powell Co., Wm., Cincinnati, O.
Q-P Mfg. Co., Needham Heights, Mass.
Royalton Co., Inc., Gasport, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
United States Gasket Co., Camden, N. J.
Walworth Co., New York, N. Y.
Warren Foundry & Pipe Corp., New York, N. Y.
Webster & Co., Warren, Camden, N. J.
Yarnall-Waring Co., Philadelphia, Pa.

JOINTS, PIPE, FLEXIBLE, SWING AND REVOLVING

Barco Mfg. Co., Barrington, Ill.
Bordo Co., Inc., L. J., Glenside, Pa.
Chiksan Co., Brea, Calif.
Flexo Supply Co., Inc., St. Louis, Mo.
Johnson Corp., The, Three Rivers, Mich.
Mayson Mfg. Co., Detroit, Mich.
Moran Flexible Joint Co., Inc., Louisville, Ky.
OPW Corp., Cincinnati, O.
Patterson-Ballagh Corp., Los Angeles, Calif.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Powell Co., Wm., Cincinnati, O.
Water Cooling Corp., New York, N. Y.

JOINTS, RUBBER EXPANSION

Goodall Rubber Co., Trenton, N. J.

JOINTS, UNIVERSAL, FOR OPERATING VALVES

Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich.
Brooks Equipment Corp., Hoboken, N. J.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Piezo Mfg. Corp., New York, N. Y.

KATA THERMOMETERS

See Thermometers, Kata

KITS, COMBUSTION TESTING

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Daigger & Co., A., Chicago, Ill.
Hays Corp., Michigan City, Ind.
Victory Engineering Corp., Union, N. J.

LACQUERS

See Enamels and Lacquers

LAGGING ADHESIVES

See Adhesives, for Pipe Covering

LAMPS, STERILIZING, FOR DUCT INSTALLATION

Coleman-Petterson Corp., Cleveland, O.
Cooper Hewitt Electric Co., Hoboken, N. J.
Fuller Co., D. William, Chicago, Ill.
General Electric Co., Lamp Div., Cleveland, O.
Hanovia Chemical & Mfg. Co., Newark, N. J.
Lustra Corp. of America, Brooklyn, N. Y.
Sampson Chemical & Pigment Corp., Chicago, Ill.
Sperti, Inc., Cincinnati, O.
Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.

LEAD PIPE

See Pipe and Tubing, Lead and Lead Alloy

LEAD SHEETS

See Sheets, Lead

LEAD TUBING

See Pipe and Tubing, Lead and Lead Alloy

LEAK DETECTORS

See Detectors, Leak, Refrigerant

LEATHER PACKING

See Packing, Leather

LIGHTS, PILOT AND SIGNAL

Cooper Co., Clark, Palmyra, N. J.
Dialight Corp., Brooklyn, N. Y.
General Electric Co., Lamp Div., Cleveland, O.
Hart Mfg. Co., The, Hartford, Conn.
Hubbell Corp., Mundelein, Ill. (for solenoid valves)
Multi-Vent Div., Pyle-National Co., Chicago, Ill.
Pyle-National Co., The, Chicago, Ill.
Signal Indicator Co., Brooklyn, N. Y.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Westinghouse Electric Corp., Pittsburgh, Pa.

LININGS, TANK

Acker Organization, Inc., W. M., Meridian, Miss.
Carboline Co., The, St. Louis, Mo.
Elastic Porcelain Lining Corp., Rochester, N. Y.
Gates Engineering Co., Wilmington, Del.
Heil Process Equipment Corp., Cleveland, O.
Heresite & Chemical Co., Manitowoc, Wis.
Industrial Filter & Pump Co., Chicago, Ill.
Norwood Associated Engineers, Inc., Springfield, Mass.
Porce-Lin Tank Lining Co., Detroit, Mich.
Wilbur & Williams Co., Brighton, Mass.

LINKS, FUSIBLE

Division Lead Co., Summit, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Register Corp., Cedar Grove, N. J.
Grinnell Co., Inc., Providence, R. I.
Morse-Smith-Morse, Inc., Watertown, Mass.
Preferred Utilities Mfg. Corp., New York, N. Y.

LIQUID LEVEL GAGES

See Gages, Liquid Level

LIQUID LEVEL INDICATORS

See Indicators, Liquid Level

LIQUID LEVEL RECORDERS

See Recorders, Liquid Level

LIQUID LEVEL REGULATORS

See Regulators, Liquid Level

LIQUID PRESSURE REGULATORS

See Regulators, Pressure, Liquid

LOCATORS, PIPE, UNDERGROUND

Fisher Research Laboratory, Inc., Palo Alto, Calif.
Globe Phone Mfg. Co., Reading, Mass.
Magna-Rod, Beloit, Wisc.
Radioactive Products Inc., Detroit, Mich.
Wilkinson Products Co., Pasadena, Calif.

LOCK FORMING MACHINES

See Machines, Pittsburgh Lock Forming

LOCK NUTS

See Nuts, Lock

LOUVERS AND SHUTTERS, AUTOMATICALLY OR MANUALLY CONTROLLED

Aerovent Fan Co., Inc., Piqua, O.
Air Conditioning Engineering Co., Cambridge, Mass.
Air Conditioning Products Co., Detroit, Mich.
Air & Refrigeration Corp., New York, N. Y.
Airmaster Corp., Chicago, Ill.
Air-Path Products Co., Baltimore, Md.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Coolair Corp., Jacksonville, Fla.
American Foundry & Furnace Co., Bloomington, Ill.
American Metal Works, Inc., New Orleans, La.
American Steel Band Co., Pittsburgh, Pa.
American Warming & Ventilating Co., Toledo, O.
Ammerman Co., C. L., Minneapolis, Minn.
Arex Co., Chicago, Ill.
Barnes Co., A. D., Dayton, O.
Belco Industries, Inc., St. Louis, Mo.
Bern's Mfg. Corp., Chicago, Ill.
Biersach & Niedermeyer Co., Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Burt Mfg. Co., Akron, O.
Champion Blower & Forge Co., Lancaster, Pa.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Commercialaire, Inc., Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Decatur Iron & Steel Co., Decatur, Ala.
Dual-Air Fan Co., South Elgin, Ill.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Elgo Shutter & Mfg. Co., Detroit, Mich.
Empire Ventilation Equipment Co., Long Island City, N. Y. (stationary)
Frigid, Inc., Brooklyn, N. Y.
General Blower Co., Morton Grove, Ill.
Ilg Electric Ventilating Co., Chicago, Ill.
Independent Register Co., Cleveland, O.
International Engineering, Inc., Dayton, O.
Jamieson Mfg. Co., Dallas, Tex.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Lockjoint Wood Products Co., Wichita, Kans. (Wood; stationary door, wall, window and ceiling)
Martin Fan & Blower Co., Chicago, Ill.
Maysteel Products, Inc., Milwaukee, Wis.
Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Muckle Mfg. Co., Owatonna, Minn.
Murray Co. of Texas, The, Atlanta, Ga.
Peerless Electric Co., Warren, O.
Phil Rich Fan Mfg. Co., Houston, Tex.
Reed Unit-Fans, Inc., New Orleans, La.
Register & Grille Mfg. Co., Brooklyn, N. Y.
Riggin Metal Products, Inc., Kankakee, Ill.
Rittling Corp., The, Buffalo, N. Y.
Robbins & Myers, Inc., Fan Div., Memphis, Tenn.
Robertson Co., H. H., Pittsburgh, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.
Signal Electric Div. of King-Seeley Corp., Menominee, Mich.
Sioux Steel Co., Sioux Falls, S. D.
Sommerfield, Inc., Lou, New York, N. Y.
Standard Stamping & Perforating Co., Chicago, Ill.
Swartwout Co., The, Cleveland, O.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Gypsum Co., Chicago, Ill.
United States Register Co., Battle Creek, Mich.
Uno Ventilator Co., Malden, Mass.
Utility Appliance Corp., Los Angeles, Calif.
Van Noorden Co., E., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.

LOUVERS, SUN REFLECTING

Kawneer Co., Niles, Mich.

LOW WATER CUT-OFFS

See Cut-offs, Low Water, Heating Boiler

LUBRICANTS, VALVE STEM

Jet-Lube, Inc., Burbank, Calif.

MACHINES, BALANCING

See Equipment, Balancing

MACHINES, BLUE PRINT AND WHITE PRINT

For Reproducing Engineering Drawings

American Photocopy Equipment Co., Chicago, Ill.
Bruning Co., Inc., Charles, Chicago, Ill.
Dietzgen Co., Eugene, Chicago, Ill.
Ozalid Div. of General Aniline & Film Corp., Johnson City, N. Y.
Paragon-Revolute Corp., Rochester, N. Y.
Pease Co., C. F., The, Chicago, Ill.
Peck & Harvey Mfg. Corp., Chicago, Ill.

MACHINES AND FILM, X-RAY

du Pont de Nemours & Co., E. I., Photo Products Dept., Wilmington, Del. (film only)
Eastman Kodak Co., Rochester, N. Y.
Keleket X-Ray Corp., Covington, Ky.
North American Philips Co., Inc., Mt. Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.

MACHINES, FLARING, PIPE AND TUBE

Chicago Pneumatic Tool Co., New York, N. Y.
Hill, Inc., Walter P., Detroit, Mich.

MACHINES, PIPE CLEANING

American Wheelabrator & Equipment Corp., Mishawaka, Ind. (for preparation of surface prior to coating)
Continental Machine Co., Chicago, Ill.
Spartan Tool Co., Chicago, Ill.
Wilson, Inc., Thomas C., Long Island City, N. Y.

MACHINES, PIPE CUTTING AND THREADING, PORTABLE

Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.
Landis Machine Co., Inc., Waynesboro, Pa.
Muncie Gear Wks., Inc., Muncie, Ind.
Obear & Son, W. F., Los Angeles, Calif.
Oster Mfg. Co., Cleveland, O.
Ridge Tool Co., Elyria, O. (Hand)
Thread-Ezy Mfg. Co., Corunna, Mich.
Toledo Pipe Threading Machine Co., Toledo, O.

MACHINES, PIPE CUTTING AND THREADING, STATIONARY

Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.
Kalamazoo Tank & Silo Co., Machine Tool Div., Kalamazoo, Mich.
Landis Machine Co., Inc., Waynesboro, Pa.
Obear & Son, W. F., Los Angeles, Calif.
Oster Mfg. Co., Cleveland, O.
Saunders Machine & Tool Corp., Yonkers, N. Y.
Stratford Pipe Scalloper Co., Clearwater, Fla.
Toledo Pipe Threading Machine Co., Toledo, O.

MACHINES, PITTSBURGH LOCK FORMING

Birks Mfg. Co., Meridan, Conn. (Pittsburgh lock seam opener)
Lockformer Co., Chicago, Ill.
Maplewood Machinery Co., Inc., Chicago, Ill.
Speed-Seam Co., Chicago, Ill.

MACHINES, REFRIGERATION, ABSORPTION

Carrier Corp., Syracuse, N. Y.
Servel, Inc., Evansville, Ind.
Vogt Machine Co., Henry, Louisville, Ky.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

MACHINES, SLIP ROLL FORMING

Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Hendley & Whitmore Co., Beloit, Wis.
Kling Bros. Engineering Wks., Chicago, Ill.
Milton Equipment Co., Philadelphia, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
San Angelo Foundry & Machine Co., San Angelo, Tex.
Webb Corp., The, Webb City, Mo.
Wysong & Miles, Inc., Greensboro, N. C.

MACHINES, TESTING, WELD

Air Reduction Sales Co., New York, N. Y.
Dillon Co., Inc., W. C., Van Nuys, Calif.
Olsen Testing Machine Co., Tinius, Willow Grove, Pa.
Radioactive Products, Inc., Detroit, Mich.

MACHINES, TUBE FINNING

Hill, Inc., Walter P., Detroit, Mich.
United Machinery Sales Co., Chicago, Ill.

MAGNESIUM ALLOY SHEETS

See Sheets, Magnesium Alloy

MAGNESIUM TUBING

See Tubing, Magnesium

MALLEABLE UNIONS

See Unions, Malleable

MANIFOLDS AND HEADERS, PREFABRICATED, FOR HEATING SYSTEMS

Acheson Mfg. Co., Rankin, Pa.
Dahl, G. W., Bristol, R. I.
Dunham Co., C. A., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I
Hi-Flow Products, Inc., Lindenhurst, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Shaw-Kendall Engineering Co., Toledo, O.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.

MANIFOLDS, REFRIGERATION

Frick Co., Waynesboro, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Mueller Brass Co., Port Huron, Mich.
Reco Products Div., Recony Corp., New York, N. Y.
Superior Valve and Fittings Co., Pittsburgh, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vilter Mfg. Co., Milwaukee, Wis.
York Corp., York, Pa.

MANOMETERS

American Meter Co., Inc., Philadelphia, Pa.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Chicago, Ill.
Elgin-Refinite, Div. of Elgin Softener Corp., Elgin, Ill.
Fischer & Porter Co., Hatboro, Pa.
Hastings Instrument Co., Inc., Warwick, Va.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
King Engineering Corp., Ann Arbor, Mich.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Inst. Labs. Inc., Riverdale, Md.
Norwalk Valve Co., South Norwalk, Conn.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Simplex Valve & Meter Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Trimount Instrument Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Wallace & Tiernan Co., Inc., Newark, N. J.
Will Corp., Rochester, N. Y.

MARKERS, PIPE, HOLE AND SADDLE

Contour Marker Corp., Compton, Calif.
Jewel Mfg. Co., St. Paul, Minn.

MECHANICAL DRIVE TURBINES

See Turbines, Mechanical Drive

MECHANICAL SPEED CHANGERS

See Changers, Speed, Mechanical

MECHANICAL TRAPS

See Traps, Steam, Mechanical

MERCURY SWITCHES

See Switches, Mercury

METAL HOSE

See Hose, Metal and Fittings

METAL, POROUS, FOR FILTRATION, SEPARATION, DIFFUSION AND FLOW CONTROL

Keystone Carbon Co., Inc., St. Marys, Pa.
Moraine Products Div., General Motors Corp., Dayton, O.
Wabash Corp., Chicago, Ill.

METALLIC BELLOWS

See Bellows, Thermostatic and Metallic

METALLIC PACKING

See Packing, Metallic

METERS, AIR VELOCITY, DIRECT READING

Air Devices, Inc., New York, N. Y.
Anemostat Corp. of America, New York, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Hastings Instrument Co., Inc., Warwick, Va.
Illinois Testing Laboratories, Inc., Chicago.
Taylor Instrument Companies, Rochester, N. Y.

METERS, BTU, FOR MEASURING FLOW AND TEMPERATURE AND CALIBRATED IN BTU OR THERMS

Bailey Meter Co., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.

METERS, CONDENSATION

American District Steam Co., Inc., North Tonawanda, N. Y.
Buffalo Meter Co., Buffalo, N. Y.
Central Station Steam Co., Detroit, Mich.
Neptune Meter Co., New York, N. Y.

METERS, FLOW, GAS OR AIR

American Meter Co., Inc., Philadelphia, Pa.
Bristol Co., The, Waterbury, Conn.
Brooks Rotameter Co., Lansdale, Pa.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Daytronic Corp., Dayton, O.
Dwyer Mfg. Co., F. W., Chicago, Ill.
Fischer & Porter Co, Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hastings Instrument Co., Inc., Warwick, Va.
Hays Corp., Michigan City, Ind.
King Engineering Corp., Ann Arbor, Mich.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
National Instrument Laboratories, Inc., Riverdale, Md.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Uehling Instrument Co., Paterson, N. J.

METERS, FLOW, REFRIGERANT

Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Builders- Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Moore Products Co., Philadelphia, Pa.
Neptune Meter Co., New York, N. Y.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Schutte & Koerting Co., Cornwells Heights, Bucks County, Pa.
Trimount Instrument Co., Chicago, Ill.
United States Gauge, Div. of American Machine and Metals, Inc., Sellersville, Pa.

METERS, FLOW, STEAM

American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
King Engineering Corp., Ann Arbor, Mich.
Mason-Neilan Regulator Co., Boston, Mass.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.

METERS, PROCESS LIQUID

American Meter Co., Inc., Philadelphia, Pa.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Bowser, Inc., Fort Wayne, Ind.
Bristol Co., The, Waterbury, Conn.
Buffalo Meter Co., Buffalo, N. Y.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Control Engineering Corp., Controls Div., Norwood, Mass.
Daytronic Corp., Dayton, O.
Drage Products, Inc., Union City, N. J.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Mason-Neilan Regulator Co., Boston, Mass.
Meriam Instrument Co., The, Cleveland, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Neptune Meter Co., New York, N. Y.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Simplex Valve & Meter Co., Philadelphia, Pa.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.
Worthington-Gamon Meter Div., Worthington Corp., Newark, N. J.

METERS, VOLUME, AIR AND GAS

American Meter Co., Inc., Philadelphia, Pa.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hastings Instrument Co., Inc., Warwick, Va.
Hays Corp., Michigan City, Ind.
Meriam Instrument Co., The, Cleveland, O.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Roots-Connersville Blower Div., Connersville, Ind.
Schutte and Kerting Co., Cornwells Heights, Bucks County, Pa.
Selas Corp. of America, Philadelphia, Pa.
Simplex Valve & Meter Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Uehling Instrument Co., Paterson, N. J.
Wallace & Tiernan Co., Inc., Newark, N. J.

METERS, WATER

American Moistening Co., Providence, R. I.
Bailey Meter Co., Cleveland, O.
Buffalo Meter Co., Buffalo, N. Y.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hersey Mfg. Co., South Boston, Mass.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
National Meter Co., Brooklyn, N. Y.
Neptune Meter Co., New York, N. Y.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Pfening Co., Fred D., Columbus, O. (batch measuring)
Republic Flow Meters Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Simplex Valve & Meter Co., Philadelphia, Pa.
Union Water Meter Co., Worcester, Mass.
Worthington-Gamon Meter Div., Worthington Corp., Newark, N. J.

MIXING VALVES

See Valves, Mixing, Steam and Water

MODULATING VALVES

See Valves, Radiator, Steam and Hot Water Modulating

MOTOR BASES

See Bases and Pads, Vibration Isolating; Bases, Motor Tension Adjusting

MOTOR CONTROLLERS

See Controllers and Starters, Motor

MOTOR OPERATED VALVES

See Valves, Motor Operated

MOTOR STARTERS

See Controllers and Starters, Motor

MOTORS, COMPRESSED AIR POWERED

Chicago Pneumatic Tool Co., New York, N. Y.
Detroit Hoist & Machine Co., Detroit, Mich.
Gardner-Denver Co., Quincy, Ill.
Ingersoll-Rand Co., New York, N. Y.
Joy Mfg. Co., Pittsburgh, Pa.
Keller Tool Co., Grand Haven, Mich.
Leiman Bros., Inc., Newark, N. J.

MOTORS, ELECTRIC, FRACTIONAL HP

ACEC Electric Corp., New York, N. Y.
Acro Mfg. Co., The, Columbus, O.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Alliance Mfg. Co., Alliance, O. (Shaded pole)
Baldor Electric Co., St. Louis, Mo.
Barber-Colman Co., Rockford, Ill.
Bodine Electric Co., Chicago, Ill.
Brown-Brockmeyer Co., Inc., Dayton, O.
Burke Electric Co., Div. of Marathon Electric Mfg. Corp., Erie, Pa.
Century Electric Co., St. Louis, Mo.
Crise Mfg. Co., The, Columbus, O.
Dayton Electric Mfg. Co., Chicago, Ill.
Delco Products Div., General Motors Corp., Dayton, O.
Diehl Mfg. Co., Somerville, N. J.
Doerr Electric Corp., Cedarburg, Wis.
Eastern Air Devices, Inc., Dover, N. H.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Electric Motor Corp., Div. of Howard Industries, Inc., Racine, Wis.
Electric Motors & Specialties, Inc., Garrett, Ind.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fasco Industries, Inc., Rochester, N. Y.
Fairbanks, Morse & Co., Chicago, Ill.
Franklin Electric Co., Inc., Bluffton, Ind.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hansen Mfg. Co., Inc., Princeton, Ind.
Holtzer-Cabot Electric Motor Div., National Pneumatic Co.,Inc., Boston, Mass.
Hoover Co., The, Electric Motor Div., North Plainfield, N. J.
Howard Industries, Inc., Racine, Wis.
Howell Electric Motors Co., Howell, Mich.
Iron Fireman Mfg. Co., Cleveland, O.
Jack & Heintz, Inc., Cleveland, O.
Kasson Die & Motors Corp., New York, N. Y.
Kraus Co., Walter S., Woodside, L. I., N. Y.
Lamb Electric Co., Kent, O.
Leland Electric Co., The, Div. of American Machine & Foundry Co., Dayton, O.
Lima Electric Motor Co., The, Lima, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Marco Industries, Inc., Depew, N. Y.
Master Electric Co., Dayton, O.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Co., The St. Louis, Mo., (Slow speed fan motors)
Ohio Electric Mfg. Co., The, Maple Heights, O.
Packard Electric Div., General Motors Corp., Warren, O.
Peerless Electric Co., Warren, O.
Portable Electric Tools, Inc., Chicago, Ill.
Redmond Co., Inc., Owosso, Mich.
Reynolds Electric Co., River Grove, Ill.
Ripley Co., Inc., Middletown, Conn.
Robbins & Myers, Inc., Springfield, O.
Royal Mfg. Corp., Waterloo, Ind.
Reuland Electric Co., Alhambra, Calif.
Small Motors Inc., Chicago, Ill.
Smith Corp., A. O., Eastern Motor Div., Dayton, O.
Smith Corp., A. O., Milwaukee, Wis.
Soreng Products Corp., Schiller Park, Ill.
Sutton Corp., O. A., The, Wichita, Kans.
Torq Electric Mfg. Corp., Bedford, O.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Universal Electric Co., Owosso, Mich.
Wagner Electric Corp., St. Louis, Mo.
Westinghouse Electric Corp., Pittsburgh, Pa.

MOTORS, ELECTRIC, 1 HP AND OVER

ACEC Electric Corp., New York, N. Y.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Allis Co., Louis, The, Milwaukee, Wis.
Baldor Electric Co., St. Louis, Mo.
Brook Motor Corp., Chicago, Ill.
Brown-Brockmeyer Co., Inc., Dayton, O.
Burke Electric Co., Div. of Marathon Electric Mfg. Corp., Erie, Pa.
Byron Jackson Co., Los Angeles, Calif. (submersible)
Century Electric Co., St. Louis, Mo.
Continental Electric Co., Inc., Newark, N. J.
Dayton Electric Mfg. Co., Chicago, Ill.
Delco Products Div., General Motors Corp., Dayton, O.
Diehl Mfg. Co., Somerville, N. J.
Doerr Electric Corp., Cedarburg, Wis.
Electric Machinery Mfg. Co., Minneapolis, Minn. (100 hp and over)
Electro Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Elliott Co., Jeannette, Pa.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fairbanks, Morse & Co., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hertner Electric Co., The, Cleveland, O.
Hoover Co., The, Electric Motor Div., North Plainfield, N. J.
Howell Electric Motors Co., Howell, Mich.
Ideal Electric & Mfg. Co., Mansfield, O.
Imperial Electric Co., Akron, O.
Kraus Co., Walter S., Woodside, L. I., N. Y.
Leland Electric Co., The, Div. of American Machine & Foundry Co., Dayton, O.
Lima Electric Motor Co., The, Lima, O.
Marathon Electric Mfg. Corp., Wausau, Wis.
Marble-Card Electric Co., Gladstone, Mich.
Master Electric Co., Dayton, O.
Moore Co., The, St. Louis, Mo., (Slow speed fan motors)
Peerless Electric Co., Warren, O.
Reliance Electric & Engineering Co., Cleveland, O.
Reuland Electric Co., Alhambra, Calif.
Robbins & Myers, Inc., Springfield, O.
Smith Corp., A. O., Eastern Motor Div., Dayton, O.
Smith Corp., A. O., Milwaukee, Wis.
Star-Kimble Motor Div., Miehle Prntg. Press & Mfg. Co., Bloomfield, N. J.
Sterling Electric Motors, Inc., Los Angeles, Calif.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Wagner Electric Corp., St. Louis, Mo.
Westinghouse Electric Corp., Pittsburgh, Pa.

MOUNTINGS, VIBRATION

See Bases and Pads, Vibration Isolating

MUFFLERS, HOT GAS, FOR REFRIGERANT LINES

Armstrong Co., Richard M., West Chester, Pa.
Industrial Acoustics Co., New York, N. Y.

MUSHROOM VENTILATORS
See Ventilators, Mushroom

NEUTRALIZERS, ACID
See Dehydrant and Acid Neutralizer

NEUTRALIZERS, ODOR
See Adsorbers, Odor

NICKEL AND NICKEL ALLOY PIPE AND FITTINGS
See Tubing, Nickel and Alloy; Fittings, Pipe, Nickel and Nickel Alloy; Pipe, Nickel and Nickel Alloy

NICKEL AND NICKEL ALLOY SHEETS
See Sheets, Nickel and Nickel Alloy

NIPPLES, PIPE, BRASS AND COPPER
Acheson Mfg. Co., Rankin, Pa.
Allen Mfg. Co., W. D., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Nipple Mfg. Co., Cicero, Ill.
Columbus Mfg. & Supply Co., Columbus, O.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
G & H Mfg. Co., Philadelphia, Pa.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grinnell Co., Inc., Providence, R. I.
Imperial Brass Mfg. Co., Chicago, Ill.
Keeney Mfg. Co., Newington, Conn.
Mueller Brass Co., Port Huron, Mich.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Star Tubular Products Co., Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Ware Coupling & Nipple Co., Ware, Mass.
Weatherhead Co., Cleveland, O.

NIPPLES, PIPE, FLEXIBLE
Johnson Metal Hose, Inc., Waterbury, Conn.
Lindy Heaters, Inc., New York, N. Y.
Techniflex Corp., Port Jervis, N. Y.

NIPPLES, PIPE, IRON AND STEEL
Allen Mfg. Co., W. D., Chicago, Ill.
Byers Co., A. M., Pittsburgh, Pa. (Wrought iron)
Chicago Nipple Mfg. Co., Cicero, Ill.
Clow & Sons, James B., Chicago, Ill.
Columbus Mfg. & Supply Co., Columbus, O.
Crane Co., Chicago, Ill.
Flori Pipe Co., The, St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (Stainless steel and alloy only)
Illinois Malleable Iron Co., Chicago, Ill.
Larkin Packer Co., Inc., St. Louis, Mo.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Penn Mfg. Corp. of Washington, Pa., Washington, Pa.
Pittsburgh Nipple Wks., Inc., Pittsburgh, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Star Tubular Products Co., Chicago, Ill.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Ware Coupling & Nipple Co., Ware, Mass.
Wheeling Machine Products Co., Wheeling, W. Va.

NIPPLES, PIPE, NICKEL AND NICKEL ALLOY
Camco Products, Inc., North Haven, Conn.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Electric Steel Foundry Co., Portland, Ore.
Flori Pipe Co., The, St. Louis, Mo.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Star Stainless Screw Co., Paterson, N. J.

NIPPLES, RADIATOR, SLIP AND SCREW
Plumb Mfg. Co., Utica, N. Y.

NOISE ELIMINATION FOR COOLING TOWERS
Industrial Acoustics Co., New York, N. Y.
Industrial Sound Control, Inc., Hartford, Conn.

NOISE ELIMINATORS
See Bases and Pads, Vibration Isolating; Hose, Metal and Fittings; Insulation, Sound Deadening

NOZZLES, ATOMIZING
American Moistening Co., Providence, R. I.
Bahnson Co., Winston-Salem, N. C.
Benjamin Air Rifle Co., St. Louis, Mo.
Bete Fog Nozzle Inc., Greenfield, Mass.
Binks Mfg. Co., Chicago, Ill.
Boston Machine Works Co., Lynn, Mass.
Delavan Mfg. Co., West Des Moines, Ia.
Eddington Metal Specialty Co., Eddington, Pa.
Electric Sprayit Div., Thomas Industries, Inc., Sheboygan, Wis.
Engineer Co., New York, N. Y.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Parks Cramer Co., Fitchburg, Mass. (Industrial humidifier)
Ross Sprinkler Co., Rosemead, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Supreme Electric Products Corp., Rochester, N. Y.
Water Cooling Corp., New York, N. Y.

NOZZLES, FLOODING
Bahnson Co., Winston-Salem, N. C.
Binks Mfg. Co., Chicago, Ill.
Spraying Systems Co., Bellwood, Ill.
Water Cooling Corp., New York, N. Y.

NOZZLES, FLOW MEASURING
Able Metal Spinning & Stamping Co., New York, N. Y.
Bailey Meter Co., Cleveland, O.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I. (open flow)
Foster Engineering Co., Union, N. J.
Foxboro Mfg. Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.

NOZZLES, OIL BURNER
Balloffet Nozzle Co., Inc., Guttenberg, N. J.
Century Engineering Corp., Cedar Rapids, Ia.
Delavan Mfg. Co., West Des Moines, Ia.
Eddington Metal Specialty Co., Eddington, Pa.
Engineer Co., New York, N. Y.
Leiman Bros., Inc., Newark, N. J.
Monarch Mfg. Works, Inc., Philadelphia, Pa.
Steinen Mfg. Co., Wm., Newark, N. J.

NOZZLES, SPARGER, FOR TANK HEATING
Heil Process Equipment Corp., Cleveland, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.

NOZZLES, SPRAY
American Cooling Tower Co., Kansas City, Mo.
American Moistening Co., Providence, R. I.
April Showers Co., Inc., Washington, D. C.
Bahnson Co., Winston-Salem, N. C.
Bayley Blower Co., Milwaukee, Wis.
Benjamin Air Rifle Co., St. Louis, Mo.
Bete Fog Nozzle Inc., Greenfield, Mass.
Binks Mfg. Co., Chicago, Ill.
Black Mfg. Co., The, Harrison, N. J.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Chain Belt Co., Milwaukee, Wis.
Clarage Fan Co., Kalamazoo, Mich.
Delavan Mfg. Co., West Des Moines, Ia.
Duriron Co., Inc., Dayton, O.
Eddington Metal Specialty Co., Eddington, Pa.
Electric Sprayit Div., Thoms Industries, Inc., Sheboygan, Wis.
Fluor Corp., Ltd., The, Los Angeles, Calif.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (ceramic)
Harry Cooling Towers, Inc., New York, N. Y.
Link-Belt Co., Chicago, Ill.
Maid-O'-Mist, Inc., Chicago, Ill.
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Parks-Cramer Co., Fitchburg, Mass.
Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Plummer Spray Equipment Co., Napoleon, O.
Pritchard & Co., of California, J. F., Kansas City, Mo.
Rega Mfg. Co., Rochester, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.
Ross Sprinkler Co., Rosemead, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skinner Irrigation Co., Troy, O.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Steinen Mfg. Co., Wm., Newark, N. J.
Supreme Electric Products Corp., Rochester, N. Y.
TOT Towers, Inc., Houston, Tex.
Thermal Agency, Houston, Tex.
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.
Yarnall-Waring Co., Philadelphia, Pa.

NUTS, LOCK
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Elastic Stop Nut Corp. of America, Union, N. J.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Grip Nut Co., Chicago, Ill.
Industrial Screw Co., Chicago, Ill.
Kwikon Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
Locknut Corp. of America, Chicago, Ill.
MacLean-Fogg Lock Nut Co., Chicago, Ill.
Palnut Co., Irvington, N. J.
Republic Steel Corp., Cleveland, O.
Republic Steel Corp., Bolt & Nut Div., Cleveland, O.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
SKF Industries, Inc., Philadelphia, Pa.
Shakeproof Div., Illinois Tool Wks., Elgin, Ill. (Lock washers)
Standard Pressed Steel Co., Jenkintown, Pa.
Star Stainless Screw Co., Paterson, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Swallow Airplane Co., Wichita, Kan.
Tinnerman Products, Inc., Cleveland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.

OBSERVATION BOILER PORTS
See Ports, Observation, Boiler

ODOR ADSORBERS
See Filters, Air; Adsorbers, Odor

ODOR NEUTRALIZERS
See Adsorbers, Odor; Compounds, Air Freshening

OIL BURNERS
See Burners, Oil

OIL COOLERS
See Coolers, Oil

OIL, CUTTING, PIPE
Blue Seal Chemical Co., Roselle Park, N. J.
Capewell Mfg. Co., Hartford, Conn.
Hercules Chemical Co., Inc., New York, N. Y.
Oster Mfg. Co., Cleveland, O.
Ridge Tool Co., Elyria, O.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Shell Oil Co., Lubricants Dept., New York, N. Y.
Standard Oil Co. of Indiana, Chicago, Ill.
Suflo, Inc., Elizabeth, N. J.
Texas Co., The, New York, N. Y.
X Laboratories, Inc., New York, N. Y.

OIL, HEAT TRANSFER
American District Steam Co., Inc., North Tonawanda, N. Y.
Monsanto Chemical Co., St. Louis, Mo.
Shell Oil Co., Lubricants Dept., New York.
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Standard Oil Co. of Indiana, Chicago, Ill.

OIL, REFRIGERATION

Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Frick Co., Waynesboro, Pa.
Gulf Oil Corp., Pittsburgh, Pa.
Houghton & Co., E. F., Philadelphia, Pa.
Illinois Oil Products, Inc., Rock Island, Ill.
Sealed Units Parts Co., Inc., Bronx, N. Y.
Shell Oil Co., Lubricants Dept., New York, N. Y.
Socony-Vacuum Oil Co., Inc., New York, N. Y.
Standard Oil Co. of California, Los Angeles, Calif.
Standard Oil Co. of Indiana, Chicago, Ill.
Sun Oil Co., Philadelphia, Pa.
Texas Co., The, New York, N. Y.
Virginia Smelting Co., West Norfolk, Va.
York Corp., York, Pa.

OIL SEPARATORS

See Separators, Steam and Oil

OILERS, FOR REFRIGERATION COMPRESSORS

Refrigeration Devices Co., Nutley, N. J.

OPERATORS, DAMPER, DUCT

Acro Mfg. Co., The, Columbus, O.
Arens Controls, Inc., Evanston, Ill.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Conoflow Corp., Philadelphia, Pa.
Consolidated Metal Products Corp., Albany, N. Y.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hagan Corp., Pittsburgh, Pa.
Hart & Cooley Mfg. Co., Holland, Mich.
Johnson Service Co., Milwaukee, Wis.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nichols Instruments Co., Baltimore, Md.
Powers Regulator Co., Skokie, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Shallcross Controls, Inc., Milwaukee, Wis.
Soreng Products Corp., Schiller Park, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Wa-Trol, Houston, Tex.
Young Regulator Co., Cleveland, O.

OPERATORS, VALVE

Arens Controls, Inc., Evanston, Ill.
Au-Temp-Co Corp., New York, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Babbitt Steam Specialty Co., New Bedford, Mass.
Barber-Colman Co., Rockford, Ill.
Benson, R. C., Pennsauken, N. J.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cameron Iron Works, Inc., Houston, Tex.
Conoflow Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Cutler-Hammer, Inc., Milwaukee, Wis.
De Zurik Shower Co., Sartell, Minn.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Janette Electric Mfg. Co., Morton Grove, Ill.
Johnson Service Co., Milwaukee, Wis.
Kieley & Mueller, Inc., Middletown, N. Y.
Ledeen Mfg. Co., Los Angeles, Calif.
Mason-Neilan Regulator Co., Boston, Mass.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nichols Instruments Co., Baltimore, Md.
Okadee Co., Chicago, Ill.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Shallcross Controls, Inc., Milwaukee, Wis.
Techniflex Corp., Port Jervis, N. Y.
Taylor Instrument Companies, Rochester, N. Y.

ORIFICE FLANGES

See Flanges, Orifice

ORIFICE UNIONS

See Unions, Orifice

ORIFICES, FLOW MEASURING

Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Madden Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Phoenix Products Co., Milwaukee, Wis. (spun metal)
Simplex Valve & Meter Co., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.

ORIFICES, RADIATOR

Au-Temp-Co Corp., New York, N. Y.
Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Grinnell Co., Inc., Providence, R. I.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Tallmadge, Webster, Systems, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.

OVERFIRE AIR JETS

See Jets, Overfire Air, for Smoke Abatement

OVER-PRESSURE UNLOADERS, FOR REFRIGERANTS

Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Hubbell Corp., Mundelein, Ill.

OXYGEN PIPING AND REGULATING SYSTEMS

Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Oxygen Equipment & Service Co., Chicago, Ill.
National Cylinder Gas Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.

OZONE APPARATUS

General Ozone Corp., Chicago, Ill.
Montgomery Bros., San Francisco, Calif.
Norwood Associated Engineers Inc., Springfield, Mass.
United States Ozone Co. of America, Scottdale, Pa.
Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.
Welsbach Corp., The, Ozone Processes Div., Philadelphia, Pa.

PACKAGED HEAT PUMP UNITS

See Unit, Air Conditioning, Reverse Refrigeration Cycle

PACKAGED STEAM GENERATORS

See Boilers, Packaged Units, Heating and Process

PACKING, ASBESTOS

Acme Asbestos Covering & Flooring Co., Chicago, Ill.
Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Crane Packing Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y.
Durabla Mfg. Co., New York, N. Y.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gatke Corp., Chicago, Ill.
Goodall Rubber Co., Trenton, N. J.
Goodyear Tire & Rubber Co., Akron, O.
Grant Wilson Inc., Chicago, Ill.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Keasbey Co., Robert A., New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Linear Incorporated, Philadelphia, Pa.
Metallo Gasket Co., New Brunswick, N. J.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Sall Mountain Co., Hamilton, O.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Rubber Co., New York, N. Y.
Zimmerman Packing Co., Cincinnati, O.

PACKING, FIBER

American Felt Co., Glenville, Conn.
Anchor Packing Co., Philadelphia, Pa.
Armstrong Cork Co., Lancaster, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Crane Packing Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y.
Durabla Mfg. Co., New York, N. Y.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Goodall Rubber Co., Trenton, N. J.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Keasbey Co., Robert A., New York, N. Y.
Linear Incorporated, Philadelphia, Pa.
Metallo Gasket Co., New Brunswick, N. J.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Products Research Co., Los Angeles, Calif.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Rubber Co., New York, N. Y.
Zimmerman Packing Co., Cincinnati, O.

PACKING, LEATHER

Alexander Bros., Philadelphia, Pa.
Anchor Packing Co., Philadelphia, Pa.
Baldwin Belting, Inc., New York, N. Y.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chicago Belting Co., Chicago, Ill.
Chicago Gasket Co., Chicago, Ill.
Davis & Co., Wayne, Westboro, Mass.
Excelsior Leather Washer Mfg. Co., Rockford, Ill.
Garlock Packing Co., Palmyra, N. Y.
Graton & Knight Co., Worcester, Mass.
Houghton & Co., E. F., Philadelphia, Pa.
Pacific States Felt & Mfg. Co., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Rhoads & Sons, J. E., Philadelphia, Pa.
Schieren Co., Chas. A., New York, N. Y.
Sims Pump Valve Co., Hoboken, N. J.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Williams & Son, I. B., Dover, N. H.
Zimmerman Packing Co., Cincinnati, O.

PACKING, METALLIC
Abbott & Biddle Co., Philadelphia, Pa.
Allpax Co., Inc., Mamaroneck, N. Y.
Anchor Packing Co., Philadelphia, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Chesterton Co., A. W., Everett, Mass.
Chicago Gasket Co., Chicago, Ill.
Conneaut Plastic Metallic Packing Co., Conneaut, O.
Crane Packing Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
France Packing Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Johns-Manville, New York, N. Y.
Linear Incorporated, Philadelphia, Pa.
National Engineering Products Inc., Washington, D. C.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Sims Pump Valve Co., Hoboken, N. J.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Rubber Co., New York, N. Y.
Zimmerman Packing Co., Cincinnati, O.

PACKING, RUBBER AND SYNTHETIC
American Felt Co., Glenville, Conn.
Anchor Packing Co., Philadelphia, Pa.
Armstrong Cork Co., Lancaster, Pa.
Belmont Packing & Rubber Co., The, Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass.
Chesterton Co., A. W., Everett, Mass.
Chicago Belting Co., Chicago, Ill.
Chicago Gasket Co., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Continental Rubber Wks., Erie, Pa.
Crane Packing Co., Chicago, Ill.
Darcoid Co., Inc., New York, N. Y.
Dow Corning Corp., Midland, Mich.
Felt Products Mfg. Co., Chicago, Ill.
Flexrock Co., Philadelphia, Pa.
Garlock Packing Co., Palmyra, N. Y.
Gates Rubber Co., Denver, Colo.
General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass.
Goodall Rubber Co., Trenton, N. J.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Graton & Knight Co., Worcester, Mass.
Greene, Tweed & Co., North Wales, Pa.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hewitt-Robins Inc., Hewitt Rubber Div., Buffalo, N. Y.
Houghton & Co., E. F., Philadelphia, Pa.
Johns-Manville, New York, N. Y.
Linear Incorporated, Philadelphia, Pa.
Minnesota Rubber & Gasket Co., Minneapolis, Minn.
New York Belting & Packing Co., Passaic, N. J.
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif.
Parker Appliance Co., The, Cleveland, O.
Products Research Co., Los Angeles, Calif.
Q-P Mfg. Co., Needham Heights, Mass.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Raybestos-Manhattan, Inc., Passaic, N. J.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown, O.
Saran Lined Pipe Co., Ferndale, Mich.
Thermoid Co., Trenton, N. J.
United States Gasket Co., Camden, N. J.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
Xylos Rubber Co., Akron, O.
Zimmerman Packing Co., Cincinnati, O.

PAINT, HIGH TEMPERATURE, FOR HOT SURFACES
American-Marietta Co., Chicago, Ill.
Baer Bros., New York, N. Y.
Babbitt Chemical Specialties Co., New Bedford, Mass.
Barreled Sunlight Paint Co., Providence, R. I. (high heat aluminum)
Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Chemical Solvent Co., Birmingham, Ala.
Claronex Products, Inc., Brooklyn, N. Y.
Continental Products Co., Euclid, O.
Debevoise Co., The, Brooklyn, N. Y.
Dixon Crucible Co., Joseph, Jersey City, N. J.
du Pont de Nemours & Co., Inc., E. I., Finishes Div., Wilmington, Del.
Flexrock Co., Philadelphia, Pa.
Foster Co., Benjamin, Philadelphia, Pa.
Hetzel Roofing Products Co., Newark, N. J.
Illinois Bronze Powder Co., Chicago, Ill.
Kellog Co., M. W., The, New York, N. Y.
Koppers Company, Inc., Pittsburgh, Pa.
Midland Paint & Varnish Co., Cleveland, O.
National Lead Co., New York, N. Y.
Nebel Mfg. Co., Cleveland, O.
O'Brien Corp., The, South Bend, Ind.
Randolph-Page, Inc., New York, N. Y. (for radiators)
S.O.S. Products Co., Inc., Brooklyn, N. Y.
Steelcote Mfg. Co., St. Louis, Mo.
Thompson and Co., Oakmont, Pa.
Tropical Paint & Oil Co., Cleveland, O.
Truscon Laboratories, Detroit, Mich.
United Chromium, Inc., New York, N. Y.
Vimasco Corp., Charleston, W. Va.
Warren Refining & Chemical Co., The, Cleveland, O.
Wilbur & Williams Co., Brighton, Mass.

PANEL BOARDS
See Boards, Panel and Control

PANEL HEATING AND COOLING
See Coils and Panels, Radiant Heating and Cooling; Conductors and Panels, Electrical, for Radiant Heating

PANELS, PERFORATED, FOR AIR DIFFUSION
Diamond Mfg. Co., Wyoming, Pa.
Harrington & King Perforating Co., Chicago.
Luminous Ceilings, Inc., Chicago, Ill.
Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Simplex Ceiling Corp., New York, N. Y.

PANELS, WINDOW, FOR AIR CONDITIONERS
Russell Co., F. C., The, Cleveland, Ohio

PARTS FOR HEATING AND AIR CONDITIONING EQUIPMENT
Ackermann Mfg. Co., Wheeling, W. Va.
Adams Co., The, Dubuque, Iowa
Air & Refrigeration Corp., New York, N. Y. (insulated panels)
Atlas Mfg. Co., St. Paul, Minn. (boiler jackets)
Berger Mfg. Div., Republic Steel Corp., Canton, O. (cabinets, housings, canopies)
Camloc Fastener Corp., New York, N. Y. (Fasteners for access panels and sheet metal)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O. (Insulating panel for housing and duct construction)
Cincinnati Metalcrafts Inc., Cincinnati, O. (sheet metal fabricating)
Commercial Shearing & Stamping Co., Youngstown, O.
Detroit Stamping Co., Detroit, Mich.
Dover Metal Products Co., The, Canal Fulton, O.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y. (hardware and parts used in fabricating dampers and turning vanes)
Dzus Fastener Co., Inc., Babylon, N. Y. (quick-acting quarter-turn fasteners for access doors, inspection panels, etc.)
Eaton Mfg. Co., Detroit, Mich. (gray iron castings for air conditioning equipment)
Falstrom Co., Passaic, N. J. (Air conditioning cabinets, steel control panels)
Lindsay Structure, Inc., Skokie, Ill. (Cabinet construotion for air conditioning and warm air heating equipment)
Metalcraft Inc., Mason City, Ia. (nameplates for equipment)
Mueller Brass Co., Port Huron, Mich. (Specially fabricated copper tubing, machine formed tubes)
National Lock Co., Inc., Rockford, Ill. (hinges, handles, latches, catches, supports, etc.)
Phoenix Products Co., Milwaukee, Wis. (metal spinnings for fan housings, diffusers, etc.)
Pittsfield Products, Inc., Ann Arbor, Mich. (perforated metal parts)
South Chester Co., Southco Div., Lester, Pa. (blind rivets, panel fasteners, adjustable pawl fasteners, door retaining springs)
Speakman Co., Wilmington, Del. (machined parts)
Rigidized Metals Corp., Buffalo, N. Y. (rigidized metal)

PARTS, REFRIGERATING COMPRESSOR
Refrigeration Devices Co., Nutley, N. J. (oiler for refrigeration compressors)
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Voss Co., Inc., J. H. H., New York, N. Y.
York Corp., York, Pa.

PENETRANT, DYE, FOR NON-DESTRUCTIVE TESTING OF METAL
Turco Products, Inc., Los Angeles, Calif.

PENETRANT SOLVENT FOR LOOSENING THREADED JOINTS
See Solvent, Penetrant

pH INDICATORS
See Indicators, pH

PILLOW BLOCK BEARINGS
See Bearings, Pillow Block

PILOT LIGHTS
See Lights, Pilot and Signal

PIPE, ALUMINUM
Aluminum Co. of America, Pittsburgh, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Colonial Alloy Co., Metals Div., Philadelphia.
Kaiser Aluminum & Chemical Corp., Oakland, Calif.
Revere Copper & Brass, Inc., New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Youngstown Welding & Engineering, Youngstown, O.

PIPE, ASBESTOS FIBER AND CEMENT
Johns-Manville, New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.

PIPE BENDERS
See Benders, Pipe

PIPE BIT SETS
See sets, Pipe Bit

PIPE, BRASS AND COPPER
American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Colonial Alloys Co., Metals Div., Philadelphia.
Gardiner Metal Co., Chicago, Ill.
Hussey & Co., C. G., Div. Copper Range Co., Pittsburgh, Pa.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Phelps Dodge Copper Products Corp., British American Tube Div., New York, N. Y.
Reading Tube Corp., New York, N. Y.
Revere Copper and Brass, Incorporated, New York, N. Y.
Wolverine Tube Div. of Calumet and Hecla, Inc., Detroit, Mich.

PIPE, CAST IRON, PRESSURE, BELL AND SPIGOT
Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Central Foundry Co., Newark, N. J.
Clow & Sons, James B., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Inner-Tite Div. of Yara Engineering Corp., Elizabeth, N. J.
Lynchburg Foundry Co., Lynchburg, Va.
McWane Cast Iron Pipe Co., Birmingham, Ala.

United States Pipe & Foundry Co., Birmingham, Ala.
Warren Foundry & Pipe Corp., New York, N. Y.

PIPE, CAST IRON, PRESSURE, FLANGED

Alabama Pipe Co., Anniston, Ala.
American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, James B., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Inner-Tite Div. of Yara Engineering Corp., Elizabeth, N. J.
Lynchburg Foundry Co., Lynchburg, Va.
McWane Cast Iron Pipe Co., Birmingham, Ala.
United States Pipe & Foundry Co., Birmingham, Ala.
Warren Foundry & Pipe Corp., New York, N. Y.

PIPE, CAST IRON, THREADED

American Cast Iron Pipe Co., Birmingham, Ala.
Clow & Sons, James B., Chicago, Ill.
McWane Cast Iron Pipe Co., Birmingham, Ala.
Somerville Iron Wks., Inc., Chattanooga, Tenn.
United States Pipe & Foundry Co., Birmingham, Ala.
Warren Foundry & Pipe Corp., New York, N. Y.

PIPE CLEANING COMPOUNDS

See Compounds, Cleaning, Pipe Coil and Condenser

PIPE CLEANING MACHINES

See Machines, Pipe Cleaning; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

PIPE COILS

See Coils, Pipe

PIPE COUPLINGS

See Couplings, Pipe

PIPE COVERING, ADHESIVES

See Adhesives, for Pipe Covering

PIPE CUTTERS

See Cutters

PIPE CUTTING MACHINES

See Machines, Pipe Cutting and Threading; Cleaners, Pipe Line, Electrically Driven; Rams, Water, for Cleaning Out Pipe Lines

PIPE EXTRACTORS

See Extractors, Pipe

PIPE, FIBER

Brown Co., Boston, Mass.
Line Material Co., Milwaukee, Wis.
Manufacturers Corp., Mansfield, O.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Richland Co., Mansfield, O.

PIPE, FINNED

Edwards Engineering Corp., Pompton Plains, N. J.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
Tenney Engineering, Inc., Union, N. J.

PIPE AND FITTINGS, GAS VENT AND FLUE

Adelta Mfg. Co., Inc., Philadelphia, Pa.
Char-Gale Mfg. Co., Minneapolis, Minn.
Condensation Engineering Corp., Chicago, Ill.
Corbman Bros., Inc., Philadelphia, Pa.
Enderle, Inc., Ltd., Frank X., Los Angeles, Calif.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Harvey Aluminum, Torrance, Calif.
Howes-Woods Co., Cambridge, Mass.
Johns-Manville, New York, N. Y.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Metal Fabricators, Inc., Charlotte, N. C.
Van-Packer Corp., Bettendorf, Ia.
Wallace Co., William, Metalbestos Div., Belmont, Calif.
Williamson Heater Co., Cincinnati, O.

PIPE FITTINGS

See Fittings, Pipe

PIPE, GLASS

Corning Glass Wks., Corning, N. Y.
Fischer & Porter Co., Hatboro, Pa.

PIPE HANGERS

See Hangers and Supports, Pipe

PIPE, HARD RUBBER

American Hard Rubber Co., New York, N. Y.
Goodrich Co., B. F., Akron, O.
Hewitt-Robins Inc., Hewitt Rubber Div., Buffalo, N. Y.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Raybestos-Manhattan, Inc., Passaic, N. J.
Stokes Molded Products, Tenton, N. J.
United States Rubber Co., New York, N. Y.
Vanton Pump & Equipment Corp., New York, N. Y.

PIPE INSULATION ADHESIVES

See Adhesives, for Pipe Covering

PIPE, JACKETED

Aluminum Co. of America, Pittsburgh, Pa. (steam traced)
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Flori Pipe Co., The, St. Louis, Mo.
Fluid Systems, Inc., New Haven, Conn.
Heat & Power Corp., Baltimore, Md.
Kaiser Co., E. B., Glenview, Ill.
Midwest Piping Co., Inc., St. Louis, Mo.
Nooter Corp., St. Louis, Mo.
Parks-Cramer Co., Fitchburg, Mass.
Pittsburgh Pipe Coil & Bending Co., Etna, Pa.
Red Jacket, Inc., Pittsburgh, Pa.
Ric-wiL Co., The, Barberton, O.
Roessing Mfg. Co., Pittsburgh, Pa.
Shaw-Kendall Engineering Co., Toledo, O.
Youngstown Welding & Engineering, Youngstown, O.

PIPE JOINT COMPOUNDS

See Cement and Compounds, Pipe Joint

PIPE LOCATORS

See Locators, Pipe, Underground

PIPE, LINED

American Brass Co., Waterbury, Conn. (Tin)
American Cast Iron Pipe Co., Birmingham, Ala. (Cement)
American Hard Rubber Co., New York, N. Y. (Rubber)
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Barrows Porcelain Enamel Corp., Cincinnati, O. (glass, ceramic-coated)
Bart Mfg. Corp., Belleville, N. J.
Cement Lined Pipe Co., Lynn, Mass. (Cement)
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Gates Engineering Co., Wilmington, Del.
Goodrich Co., B. F., Akron, O. (Rubber-lined)
Heil Process Equipment Corp., Cleveland, O.
Heresite & Chemical Co., Manitowoc, Wis.
Jones & Laughlin Steel Corp., Pittsburgh, Pa. (Cement)
Kaiser Co., E. B., Glenview, Ill.
Knight, Maurice A., Akron, O.
LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin lined)
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Michigan Pipe Co., Bay City, Mich. (Wood, saran rubber)
National Lead Co., New York, N. Y. (Lead)
Nooter Corp., St. Louis, Mo.
Raybestos-Manhattan, Inc., Passiac, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (Lead)
Saran Lined Pipe Co., Ferndale, Mich.
United States Rubber Co., New York, N. Y. (Rubber)
United States Stoneware Co., New York.
Warren Foundry & Pipe Corp., New York, N. Y. (Cement)
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, NICKEL AND NICKEL ALLOY

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Biggs Boiler Works Co., The, E. Akron, O.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Chase Brass & Copper Co., Waterbury, Conn.
Electric Steel Foundry Co., Portland, Ore.
Globe Steel Tubes Co., Milwaukee, Wis.
International Nickel Co., Inc., The, New York, N. Y.
Revere Copper and Brass. Incorporated, New York, N. Y.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering, Youngstown, O.

PIPE, NICKEL PLATED

Irvington Varnish & Insulator, Div. of Minn. Mining & Mfg. Co., Irvington, N. J.

PIPE, PLASTIC

Acadia Synthetic Products, Div., Western Felt Works, Chicago, Ill.
Alpha Plastics, Inc., W. Orange, N. J. (PVC)
American Agile Corp., Cleveland, O.
American Hard Rubber Co., New York, N. Y.
Anesite Co., Chicago, Ill. (polyethylene, butyrate)
Aqua-Therm, Inc., Dayton, O.
Associated Plastic Co's., Inc., Midland, Mich. (rigid polyvinyl)
Atlas Mineral Products Co., Mertztown, Pa.
Carlon Products Corp., Cleveland, O.
Chesflex Corp., Yonkers, N. Y.
Commercial Plastics Co., Chicago, Ill.
Continental Can Co., Millsplastic Pipe Div., New York, N. Y.
Continental-Diamond Fibre Co., Newark, Del.
Crane Co., Chicago, Ill.
Crescent Plastics, Inc., Evansville, Ind. (flexible, semi-rigid)
Fibercast Corp., Tulsa, Okla.
Franklin Plastics, Inc., Franklin, Pa. (polyethylene)
Goodrich Chemical Co., B. F., Cleveland, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hartwell & Son, Inc., H. N., Boston, Mass.
Haveg Corp., Newark, Del. (Resin-asbestos, polyester glass & polyvinyl chloride)
Heil Process Equipment Corp., Cleveland, O.
Irvington Varnish & Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J. (flexible)
Johnson Plastic Corp., Chagrin Falls, O. (polyethylene, tenite & kralastic)
Knight, Maurice A., Akron, O.
Manufacturers Corp., Mansfield, O.
Michigan Plastic Pipe Co., Detroit, Mich.
Munray Products, Inc., Cleveland, O. (polyethylene, flexible)
National Tube Div., United States Steel Corp., Pittsburgh, Pa. (flexible polyethylene)
North Penn Co., New York, N. Y.
Panelyte Div., St. Regis Paper Co., New York, N. Y.
Plastex Corp., Columbus, O.
Plastipipe, Inc., Inglewood, Calif.
Plymouth Industrial Products, Inc., Plymouth, Wis.
Republic Steel Corp., Cleveland, O.
Richland Co., Mansfield, O.
Saran Lined Pipe Co., Ferndale, Mich.
Skyline Industries, Titusville, Pa.
Southwestern Plastic Pipe Co., Mineral Wells, Tex.
Texas Vitrified Pipe Co., Mineral Wells, Tex. (polyethylene-rigid PVC)
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (flexible, semi-rigid high impact & rigid PVC)
Tube Turn Plastics, Inc., Louisville, Ky. (PVC)
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York.
Van Dorn Iron Wks., Cleveland, O.
Vanton Pump & Equipment Corp., New York,

N. Y. (Buna and Styrene-Buna N)
Western Plastics Corp., Tacoma, Wash. polyethylene & kralastic)
Wilmington Plastics, Inc., Wilmington, Del. (PVC rigid)
Yardley Plastics Co., Columbus, O.

PIPE PLUGS
See Plugs, Pipe

PIPE, PRE-INSULATED
Durant Insulated Pipe Co., Palo Alto, Calif.
Durant International Corp., Williamstown, N. J.
Flexible Tubing Corp., Guilford, Conn.
Kaiser Co., E. B., Glenview, Ill.
Ric-wiL Co., The, Barberton, O.
Universal Sewer Pipe Co., Cleveland, Ohio

PIPE REAMERS
See Reamers, Pipe

PIPE REPAIR CLAMPS
See Clamps, Pipe Repair

PIPE, SPIRAL, RIVETED AND WELDED
Armco Drainage & Metal Products, Inc., Middletown, O.
Biggs Boiler Wks., Co., The, E. Akron, O.
Naylor Pipe Co., Chicago, Ill.
Nikoh Tube Co., Chicago, Ill.
Taylor Forge & Pipe Wks., Chicago, Ill.
Wickwire Spencer Steel Div. of Colorado Fuel & Iron Corp., New York, N. Y.

PIPE, STEEL, ALLOY
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Globe Steel Tubes Co., Milwaukee, Wis.
Michigan Pipe Co., Bay City, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Taylor Forge & Pipe Wks., Chicago, Ill.
Trent Tube Co., East Troy, Wis.
Wheeling Steel Corp., Wheeling, W. Va.
Wickwire Spencer Steel Div. of Colorado Fuel & Iron Corp., New York, N. Y.
Youngstown Sheet & Tube Co., Youngstown, O.
Youngstown Welding & Engineering, Youngstown, O.

PIPE, STEEL, BUTT AND LAP WELDED
Bethlehem Steel Co., Bethlehem, Pa.
Biggs Boiler Works Co., The, E. Akron, O. (large diameter)
Byers Co., A. M., Pittsburgh, Pa.
Chicago Metal Mfg. Co., Chicago, Ill.
Claymont Steel Corp., Div. of Colorado Fuel & Iron Corp., Claymont, Del.
Electric Steel Foundry Co., Portland, Ore.
Fretz-Moon Tube Co., Butler, Pa.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Laclede Steel Co., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y. (Specially fabricated)
Smith Corp., A. O., Milwaukee, Wis.
South Chester Tube Co., Chester, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Taylor Forge & Pipe Wks., Chicago, Ill.
Tippett & Wood, Phillipsburgh, N. J. (12 in. and larger)
Wheatland Tube Co., Philadelphia, Pa.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, STEEL, SEAMLESS
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Globe Steel Tubes Co., Milwaukee, Wis.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Timken Roller Bearing Co., Canton, O.
Trent Tube Co., East Troy, Wis.
Youngstown Sheet & Tube Co., Youngstown, O.

PIPE, STEEL, STAINLESS
Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Electric Steel Foundry Co., Portland, Ore.
Excelsior Steel Furnace Co., The, Chicago, Ill.
Globe Steel Tubes Co., Milwaukee, Wis.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Michigan Pipe Co., Bay City, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Naylor Pipe Co., Chicago, Ill.
Pypon Co., Pittsburgh, Pa.
Republic Steel Corp., Steel and Tubes Div., Cleveland, O.
Standard Tube Co., Detroit, Mich.
Star Stainless Screw Co., Paterson, N. J.
Timken Roller Bearing Co., Canton, O.
Trent Tube Co., East Troy, Wis.
Youngstown Welding & Engineering, Youngstown, O.

PIPE, STONEWARE
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J.
Knight, Maurice A., Akron, O.
United States Stoneware Co., New York, N. Y.

PIPE SUPPORTS
See Hangers and Supports, Pipe

PIPE SURFACE, THERMOMETERS
See Thermometers, Indicating, Pipe Surface

PIPE, TIN
Alpha Metals, Inc., Brooklyn, N. Y.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Gardiner Metal Co., Chicago, Ill.
National Lead Co., New York, N. Y.
Northwest Lead Co., Seattle, Wash.
Standard Rolling Mills, Inc., Brooklyn, N. Y.

PIPE TONGS
See Tongs, Pipe

PIPE, TUBING, FITTINGS AND VALVES, CARBON AND GRAPHITE
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.

PIPE AND TUBING, LEAD AND LEAD ALLOY
Alpha Metals, Inc., Brooklyn, N. Y.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Gardiner Metal Co., Chicago, Ill.
Lissberger & Son, Inc., Marks, Long Island City, N. Y.
National Lead Co., New York, N. Y.
Northwest Lead Co., Seattle, Wash.
Rochester Lead Works, Inc., Rochester, N. Y.
Standard Rolling Mills, Inc., Brooklyn, N. Y.
United States Stoneware Co., New York, N. Y.

PIPE, VITRIFIED CLAY
Bowerston Shale Co., The, Bowerston, O.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J.
Kaul Clay Mfg. Co., The, Toronto, O.
Logan Clay Product Co., The, Logan, O.
Robinson Clay Product Co., The, Akron, O.
Stillwater Clay Products Co., The, Cleveland, O.
Superior Clay Corp., The, Uhrichsville, O.
Texas Vitrified Pipe Co., Mineral Wells, Tex.
Universal Sewer Pipe Co., Cleveland, O.

PIPE, WOOD
Caldwell Co., W. E., Louisville, Ky.
Michigan Pipe Co., Bay City, Mich.
Sante Fe Tank & Tower Co., Los Angeles.

PIPE WRENCHES
See Wrenches, Pipe

PIPE, WROUGHT IRON
Byers Co., A. M., Pittsburgh, Pa.

PIPING, FABRICATED
See Bends, Expansion, Steam Pipe; Headers, Pipe, Welded; Coils, Pipe

PIPING IDENTIFICATON MARKERS
See Identification Markers for Piping Services

PISTON RINGS
See Rings, Piston

PITOT TUBES
See Tubes, Pitot

PITTSBURGH LOCK FORMING MACHINES
See Machines, Pittsburgh Lock Forming

PLASTIC PIPE AND PIPE FITTINGS
See Pipe, Plastic; Fittings, Pipe, Plastic

PLASTIC TUBING
See Tubing, Plastic

PLATES, FLOOR AND CEILING
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Eastern Stainless Steel Corp., Baltimore, Md.
Farley Sleeve & Hanger Co., Cleveland, O.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
G & H Mfg. Co., Philadelphia, Pa.
Grinnell Co., Providence, R. I.
Hupp Corp., Globe Stamping Div., Cleveland, O.
Keeney Mfg. Co., Newington, Conn.
Little Mfg. Co., M. S., Hartford, Conn.
New York Air Valve Corp., Brooklyn, N. Y.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
U. S. Plug & Fitting Co., Wellington, O.
Walworth Co., New York, N. Y.
Zurn Mfg. Co., J. A., Erie, Pa.

PLUG COCKS
See Valves, Plug

PLUG VALVES
See Valves, Plug

PLUGS, FUSIBLE, BOILER
Allen Mfg. Co., W. D., Chicago, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Chiksan Co., Brea, Calif.
Division Lead Co., Summit, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Powell Co., Wm., The, Cincinnati, O.
Swift Lubricator Co., Inc., Elmira, N. Y.

PLUGS, PIPE, MAGNETIC, FOR REMOVING FERROUS PARTICLES
Magnetic Drain Plug Co., Wellington, O.
U. S. Plug & Fitting Co., Wellington, O.

PLUGS, REPAIR, FOR PIPE

Adams Pipe Repair Products, El Monte, Calif.
Kuhns Bros. Co., Dayton, O.
Lamerson & Sessions Co., The, Cleveland, O.
Parker-Kalon Div., Gen. Am. Trans. Corp., New York, N. Y.

PLUGS, REPAIR, FOR TANKS

Adams Pipe Repair Products, El Monte, Calif.
Chicago Specialty Mfg. Co., Chicago, Ill.
Kenney Co., L. C., Chicago, Ill.
Parker-Kalon Div., Gen. Am. Trans. Corp., New York, N. Y.
Standard Pressed Steel Co., Jenkintown, Pa.
U. S. Plug & Fitting Co., Wellington, O.

PLUGS, TUBING TEST

Chicago Specialty Mfg. Co., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.

PORTS, OBSERVATION, BOILER

Bigelow Liptak Corp., Detroit, Mich.
Chicago Fire Brick Co., Chicago, Ill.
Detroit Stoker Co., Detroit, Mich.
Ess Instrument Co., Bergenfield, N. J.
Green Fire Brick Co., Mexico, Mo.
Henriksen Co., C. O., Chicago, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Plibrico Co., Chicago, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Ramtite Co., The, Chicago, Ill.
Reintjes Co., Geo. P., Kansas City, Mo.
Springfield Boiler Co., Springfield, Ill.

POSITIONERS, WELDING

All-State Welding Alloys Co., Inc., White Plains, N. Y.
Johnson Machine Works, Eau Claire, Wis.
National Cylinder Gas Co., Chicago, Ill.
Sight Feed Generator Co., West Alexandria, O.

POWER FACTOR CORRECTION

See Capacitors

POWER SHEARS

See Shears, Power

PREHEATERS, FUEL OIL

Alstrom Corp., New York, N. Y.
American District Steam Co., Inc., North Tonawanda, N. Y.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
Andale Co., Philadelphia, Pa.
Bell & Gossett Co., Morton Grove, Ill.
Brown Fintube Co., The, Elyria, O.
Coen Co., San Francisco, Calif.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Crotty Mfg. Co., Flushing, L. I., N. Y.
Davis Engineering Corp., Elizabeth, N. J.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Downingtown Iron Works, Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drying Systems, Inc., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Electro-Therm, Inc., Silver Spring, Md.
Engineer Co., New York, N. Y.
Falcon Equipment Co., New Brighton, Pa.
Fluid Systems, Inc., New Haven, Conn.
General Fittings Co., Providence, R. I.
General Heaters & Regulators Co., East Chicago, Ind.
Griscom-Russell Co., Massillon, O.
Hauck Mfg. Co., Brooklyn, N. Y.
Heatron, Inc., York, Pa.
Heatube Corp., Allegan, Mich.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo. (Electric)
Johnson Corp., The, Three Rivers, Mich.
Kaiser Co., E. B., Glenview, Ill.
Kewanee-Ross Corp., Kewanee, Ill.
Leahy Mfg. Co., Los Angeles, Calif.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Lientz Co., B. P., Kansas City, Mo.
Manning & Lewis Engineering Co., Newark, N. J.
National Pipe Bending Co., New Haven, Conn.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Peabody Engineering Corp., New York, N. Y.
Preferred Utilities Mfg. Corp., New York, N. Y.
Reliable Products Mfg. Co., Brooklyn, N. Y.
Rempe Co., Chicago, Ill.
Richmond Engineering Co., Inc., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Sims Co., Erie, Pa.
Staples & Pfeiffer, San Francisco, Calif.
Superior Combustion Industries, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Todd Shipyards Corp., Combustion Equipment Div., Elmhurst, N. Y.
Tranter Mfg., Inc., Lansing, Mich.
Trent Inc., Philadelphia, Pa.
Vulcan Electric Co., Danvers, Mass.
Whitlock Mfg. Co., Hartford, Conn.
Wiegand Co., Edwin L., Pittsburgh, Pa. (Electric)
Yula Water Heaters Inc., New York, N. Y.

PREHEATERS AND STRESS RELIEVERS, ELECTRIC, FOR PIPE WELDS

Electric Arc, Inc., Newark, N. J.
Falcon Equipment Co., New Brighton, Pa.
Heatube Corp., Allegan, Mich.
Martin-Quaid Co., Philadelphia, Pa.
Trent Inc., Philadelphia, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

PRE-INSULATED PIPE

See Pipe, Pre-Insulated

PRESSURE BLOWERS

See Blowers, High Pressure

PRESSURE CONTROLLERS

See Regulators, Pressure

PRESSURE GAGES

See Gages, Indicating, Pressure

PRESSURE INDICATOR-CONTROLLERS

See Indicator-Controllers, Pressure

PRESSURE RECORDER-CONTROLLERS

See Recorder-Controllers, Pressure

PRESSURE RECORDERS

See Recorders, Pressure and Vacuum

PRESSURE REDUCING VALVES

See Valves, Pressure Reducing and Regulating

PRESSURE REGULATING VALVES

See Valves, Pressure Reducing and Regulating

PRESSURE REGULATORS

See Regulators, Pressure

PRESSURE SWITCHES

See Switches, Pressure and Vacuum

PROCESS HEATING SYSTEMS

See Systems, Process Heating, High Temperature

PROCESS STEAM SUPERHEATERS

See Superheaters, Process Steam

PROCESS AND STORAGE TANKS

See Tanks, Process and Storage

PROPANE VAPORIZERS

See Vaporizers

PROPELLER FANS

See Fans, Propeller

PROPELLER PUMPS

See Pumps, Propeller

PROPORTIONING PUMPS

See Pumps, Proportioning

PROTECTIVE COATINGS

See Coatings, Protective, for Metal

PROTECTORS, GAGE GLASS

Bache, Semon & Co., New York, N. Y.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Wright-Austin Co., Detroit, Mich.

PROTECTORS, PIPE COVERING

Bigelow-Liptak Corp., Detroit, Mich.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Carpenter & Paterson, Inc., Cambridge, Mass.
Childers Mfg. Co., Houston, Tex.
Cinder Products Corp., Providence, R. I.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Grant Wilson Inc., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Keystone Asphalt Products Co., Chicago, Ill.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Poe Co., C. W., The, Cleveland, O. (Alum. jacketing)
Reynolds Metals Co., Louisville, Ky.
Ric-wiL Co., The, Barberton, O.
Smith Products Co., Northville, Mich.
Weston Electrical Instrument Corp., Newark, N. J.

PSYCHROMETERS, MOTOR ASPIRATED

Bahnson Co., Winston-Salem, N. C.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Scientific Instrument Co., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

PSYCHROMETERS, SLING AND HAND ASPIRATED

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
American Moistening Co., Providence, R. I.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
General Scientific Equipment Co., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Johnson Service Co., Milwaukee, Wis.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Parks-Cramer Co., Fitchburg, Mass.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

PSYCHROSTATS

See Humidistats

PULLEYS AND SHEAVES, FOR BELT DRIVES

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Boston Woven Hose & Rubber Co., Cambridge, Mass. (taper bushing)
Browning Mfg. Co., Inc., Maysville, Ky.
Central Die Casting & Mfg. Co., Inc., Chicago, Ill. (V belt)
Chicago Die Casting Mfg. Co., Chicago, Ill. (v-type and flat type)
Climax Metal Products Co., Cleveland, O. (v-belt and variable pitch)

Congress Drives Div., Tann Corp., Detroit, Mich. (V belt—fractional and multiple horsepower, and variable pitch)
Dayton Rubber Co., Dayton, O.
Dick Co., Inc., R. & J., Passaic, N. J. (Steel split)
Dodge Mfg. Corp., Mishawaka, Ind.
Durkee-Atwood Co., Minneapolis, Minn. (V-Belt)
Duro Metal Products Co., Chicago, Ill. (steel & diecast)
Ft. Worth Steel & Machinery Co., Ft. Worth, Texas
Gates Rubber Co., The, Denver, Colo.
Goldens' Foundry & Machine Co., Columbus, Ga. (Cast iron)
Jones Foundry Machine Co., W. A., Chicago, Ill. (flat)
Lau Blower Co., Dayton, O.
Lewellen Mfg. Co., Columbus, Ind.
Lovejoy Flexible Coupling Co., Chicago, Ill.
Maurey Mfg. Corp., Chicago, Ill. (v-belt steel and cast iron)
Medart Co., St. Louis, Mo.
Mercury Clutch Div., Automatic Steel Products, Inc., Canton, O.
Pyott Foundry & Machine Co., Chicago, Ill.
Reeves Pully Co., Columbus, Ind. (variable speed)
Speed Selector Inc., Cleveland, O. (variable pitch)
Sprout-Waldron & Co., Muncy, Pa.
Utility Fan Corp., Los Angeles, Calif.
V-Belt Clutch Co., Los Angeles, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
W. C. Products, Inc., Santa Monica, Calif.
Wood's Sons Co., T. B., Chambersburg, Pa.
Worthington Corp., Harrison, N. J. (v-type)
Zatko Metal Products Co., Euclid, O.

PULVERIZED COAL BURNERS

See Burners, Pulverized Coal

PUMP BASES

See Bases and Pads, Vibration Isolating

PUMP UNITS, FUEL OIL

See Units, Fuel Oil, Heating, Pumping and Straining

PUMP VALVES

See Valves, Pump

PUMPS, BOILER FEED

Aldrich Pump Co., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Buffalo Pumps, Inc., Buffalo, N. Y.
Byron Jackson Co., Los Angeles, Calif.
Chicago Pump Co., Chicago, Ill.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Clayton Mfg. Co., El Monte, Calif.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks., Co., Columbus, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cyclotherm Div., United States Radiator Corp., Oswego, N. Y.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Decatur Pump Co., Decatur, Ill.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham Co., C. A., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eclipse Fuel Engineering Co., Rockford, Ill.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Guild & Garrison, Inc., Brooklyn, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Corp., The, Three Rivers, Mich.
Johnston Pump Co., Pasadena, Calif.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Lawrence Pump & Engine Co., Lawrence, Mass.
Lecourtenay Co., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
McDonnell & Miller, Inc., Chicago, Ill.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Nash Engineering Co., South Norwalk, Conn.
National Steam Pump Co., Upper Sandusky, O.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Perry Co., Waco, Tex.
Philadelphia Pump & Machinery Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York.
Robbins & Myers, Inc., Springfield, O.
Roth Co., Roy E., Rock Island, Ill.
Schaub Engineering Co., Fred H., Chicago, Ill.
Skidmore Corp., St. Joseph, Mich.
Sterling, Inc., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Swaby Mfg. Co., Chicago, Ill.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CENTRIFUGAL

Advance Pump Co., Berkeley, Calif.
Alliance Industries, Huntingden Valley, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Well Wks., Aurora, Ill.
Aurora Pump Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Barrett, Haentjens & Co., Hazleton, Pa.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Bell & Gossett Co., Morton Grove, Ill.
Berkeley Pump Co., Berkeley, Calif.
Blaisdell Compressor Co., New York, N. Y.
Buffalo Pumps, Inc., Buffalo, N. Y.
Byron Jackson Co., Los Angeles, Calif.
Carver Pump Co., Muscatine, Ia.
Chain Belt Co., Milwaukee, Wis.
Chempump Corp., Philadelphia, Pa. (magnetically driven)
Chicago Pump Co., Chicago, Ill.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davidson Co., M. T., New York, N. Y.
Dayton Electric Mfg. Co., Chicago, Ill.
Dayton Pump & Mfg. Co., Dayton, O.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Decatur Pump Co., Decatur, Ill.
DeLaval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham Co., C. A., Chicago, Ill.
Duriron Co., Inc., Dayton, O. (Acid resisting)
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries Inc., Hamden, Conn.
Eco Engineering Co., Newark 1, N. J.
Econo Products Co., East Haddam, Conn.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Essick Mfg. Co., Los Angeles, Calif.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Foster Pump Works, Inc., Brooklyn, N. Y.
Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Frederick Iron & Steel Inc., Frederick, Md.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Gardner-Denver Co., Quincy, Ill.
Gelber Co., Samuel S., Chicago, Ill.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (Chemical stoneware, porcelain and graphite)
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Goodfellow Co., Inc., F. D., Memphis, Tenn.
Gorman-Rupp Industries, Inc., Belleville, O.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Graymills Corp., Chicago, Ill.
Guild & Garrison, Inc., Brooklyn, N. Y.
Industrial Filter & Pump Co., Chicago, Ill.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Kenco Pump Co., Lorain, O.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
La Bour Co., Inc., The, Elkhart, Ind.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pump Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead lined and all lead)
Lecourtenay Co., Newark, N. J.
Lewis & Co., Inc., Chas. S., St. Louis, Mo.
Leyman Mfg. Corp., John H., McGowan Co. Div., Cincinnati, O.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Marlow Pumps, Subsidiary of Bell & Gossett Co., Ridgewood, N. J.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Memphis Pump & Mfg. Co., Memphis, Tenn.
Morris Machine Works, Baldwinsville, N. Y.
Myers & Bro. Co., F. E., The, Ashland, O.
National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National Lead Co., New York, N. Y.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless of America, Inc., Chicago, Ill.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Radiant Utilities Corp., Brooklyn, N. Y.
Saran Lined Pipe Co., Ferndale, Mich. (Saran Lined)
Schneible Co., Claude B., Detroit, Mich.
Skidmore Corp., St. Joseph, Mich.
Smith Corp., A. O., Milwaukee, Wis.
Standard Electric Mfg. Co., West Berlin, N. J.
Sterling, Inc., Milwaukee, Wis.
Sumo Pumps, Inc., Stamford, Conn. (for submerged operation)
Swaby Mfg. Co., Chicago, Ill.
Taber Pump Co., Buffalo, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Trane Co., The, LaCrosse, Wis.
Union Steam Pump Co., Battle Creek, Mich.
Universal Mfg. Co., Berkeley, Calif.
Utility Appliance Corp., Los Angeles, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., New York, N. Y.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Whitewater Pump Co., Inc., Whitewater, Wis.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, CONDENSATE, FOR REMOVING CONDENSATION FROM AIR CONDITIONING UNITS

Ashcraft Co., J. P., Dallas, Tex.
Beach-Russ Co., New York, N. Y.
Davidson Co., M. T., New York, N. Y.
Deming Co., Salem, O.
Egan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries, Inc., Hamden, Conn.
Gelber Co., Samuel S., Chicago, Ill.
Johnson Pump Co., Pasadena, Calif.
Kenco Pump Co., Lorain, O.

Little Giant Vaporizer Co., Inc., Oklahoma City, Okla.
Midwest Mfg. Co., Lawrence, Kans.
Myers & Bro. Co., F. E., The, Ashland, O.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chem. Corp., Los Angeles, Calif.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

PUMPS, CONDENSATION RETURN

Advance Pump Co., Berkeley, Calif.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Inc., Buffalo, N. Y.
Byron Jackson Co., Los Angeles, Calif.
Chicago Pump Co., Chicago, Ill.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Cochrane Corp., Philadelphia, Pa.
Coffin Co., J. S., Jr., Englewood, N. J.
Columbus Steam Pump Wks. Co., Columbus, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Dean Hill Pump Co., Indianapolis, Ind.
Decatur Pump Co., Decatur, Ill.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham Co., C. A., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries, Inc., Hamden, Conn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Faber Engineering Co., Inc., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Guild & Garrison, Inc., Brooklyn, N. Y.
Healey Co., Lee, Glendale, Calif.
Heating Assurance, Inc., Spokane, Wash.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Corp., The, Three Rivers, Mich.
Johnston Pump Co., Pasadena, Calif.
Kisco Boiler & Engineering Co., St. Louis.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Lawrence Pump & Engine Co., Lawrence, Mass.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
Nash Engineering Co., South Norwalk, Conn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Perry Co., Waco, Tex.
Roth Co., Roy E., Rock Island, Ill.
Schaub Engineering Co., Fred H., Chicago.
Sellers Engineering Co., Chicago, Ill.
Skidmore Corp., St. Joseph, Mo.
Sterling, Inc., Milwaukee, Wis.
Stout & Sons, David, St. Louis, Mo.
Swaby Mfg. Co., Chicago, Ill.
Trane Co., The, LaCrosse, Wis.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, EVAPORATIVE COOLER

Chempump Corp., Philadelphia, Pa.
Deming Co., Salem, O.
Goulds Pumps, Inc., Seneca, N. Y.
Ingersoll-Rand Co., New York, N. Y.
International Metal Products, Phoenix, Ariz.
Midwest Mfg. Co., Lawrence, Kans.
Myers & Bro. Co., F. E., The, Ashland, O.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Wright Mfg. Co., Phoenix, Ariz.

PUMPS, DEEP WELL, TURBINE

American Well Wks., Aurora, Ill.
Aurora Pump Co., Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Byron Jackson Co., Los Angeles, Calif.
Davidson Co., M. T., New York, N. Y.
Decatur Pump Co., Decatur, Ill. (shallow well)
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Guild & Garrison, Inc., Brooklyn, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Pump Co., Pasadena, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Layne & Bowler, Inc., Memphis, Tenn.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Smith Corp., A. O., Milwaukee, Wis.
Universal Mfg. Co., Berkeley, Calif.
Whitewater Pump Co., Inc., Whitewater, Wis.
Worthington Corp., Harrison, N. J.

PUMPS, FIRE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Buffalo Pumps, Inc., Buffalo, N. Y.
Chicago Pump Co., Chicago, Ill.
Davidson Co., M. T., New York, N. Y.
De Laval Steam Turbine Co., Trenton, N. J.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gorman-Rupp Industries, Inc., Belleville, O.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Guild & Garrison, Inc., Brooklyn, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Layne & Bowler, Inc., Memphis, Tenn.
Lecourtenay Co., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co. Div., Cincinnati, O.
Marlow Pumps, Subsidiary of Bell & Gossett Co., Ridgewood, N. J.
Myers & Bro. Co., F. E., The, Ashland, O.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Solar Aircraft Co., San Diego, Calif.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Worthington Corp., Harrison, N. J.

PUMPS, HIGH PRESSURE, HYDRAULIC

Aldrich Pump Co., Allentown, Pa.
American Engineering Co., Philadelphia, Pa.
American Instrument Co., Inc., Silver Spring, Md.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Blackhawk Mfg. Co., Milwaukee, Wis.
Byron Jackson Co., Los Angeles, Calif.
C C Pump Mfg. Div., Palmyra, N. J.
Carpenter Valve Corp., The, Cleveland, O. (hand)
Coffin Co., J. S., Jr., Englewood, N. J.
Commercial Shearing & Stamping Co., Youngstown, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davidson Co., M. T., New York, N. Y.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Gorman-Rupp Industries, Inc., Belleville, O.
Guild & Garrison, Inc., Brooklyn, N. Y.
Kobe Inc., Div. of Dresser Equipment Co., Huntington Park, Calif.
Ledeen Mfg. Co., Los Angeles, Calif.
Milton Roy Co., Philadelphia, Pa.
National Steam Pump Co., Upper Sandusky, O.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Robbins & Myers, Inc., Springfield, O.
Roper Corp., Geo. D., Rockford, Ill.
Royalton Co., Inc., Gasport, N. Y.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Texsteam Corp., Houston, Tex.
Tuthill Pump Co., Chicago, Ill.
Union Steam Pump Co., Battle Creek, Mich.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

PUMPS, HYDROSTATIC TEST, HAND-OPERATED

Capitol Machine Wks., Oakland, Calif.
Deming Co., Salem, O.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Pacific Pumping Co., Oakland, Calif.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

PUMPS, LIQUID REFRIGERANT CIRCULATING

Alliance Industries, Huntingden Valley, Pa.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Byron Jackson Co., Los Angeles, Calif.
Chempump Corp., Philadelphia, Pa.
Chicago Pump Co., Chicago, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
De Laval Steam Turbine Co., Trenton, N. J.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Frick Co., Waynesboro, Pa.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Guild & Garrison, Inc., Brooklyn, N. Y.
Heatron, Inc., York, Pa.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lewis & Co., Chas. S., St. Louis, Mo.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Perry Co., Waco, Tex.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Roper Corp., Geo. D., Rockford, Ill.
Roth Co., Roy E., Rock Island, Ill.
Viking Pump Co., Cedar Falls, Ia.
Vilter Mfg. Co., Milwaukee, Wis.
Warren Steam Pump Co., Inc., Warren, Mass.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

PUMPS, PROPELLER

American Well Works, Aurora, Ill.
Berkeley Pump Co., Berkeley, Calif.
Byron Jackson Co., Los Angeles, Calif.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Haertel Co., Walter, Minneapolis, Minn.
Ingersoll-Rand Co., New York, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Lawrence Pumps, Inc., Lawrence, Mass.
Morris Machine Wks., Baldwinsville, N. Y.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Worthington Corp., Harrison, N. J.

PUMPS, PROPORTIONING

American Instrument Co., Inc., Silver Spring, Md.
Bird-Archer Co., Philadelphia, Pa.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.

Bruner Corp., Milwaukee, Wis.
C C Pump Mfg. Div., Palmyra, N. J.
Cochrane Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Dearborn Chemical Co., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Jacuzzi Bros., Inc., Richmond, Calif.
Madden Corp., The, Chicago, Ill.
Marco Co., Inc., Saginaw, Mich.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Nelson Chemical Pumps, Casper, Wyo.
Precision Chemical Pump Corp., Waltham, Mass.
Philadelphia Pump and Machinery Co., Inc., Philadelphia, Pa.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Robbins & Myers, Inc., Springfield, O.
Texsteam Corp., Houston, Tex.
Wallace & Tiernan Co., Inc., Newark, N. J.

PUMPS, RECIPROCATING

Aldrich Pump Co., Allentown, Pa.
American Hard Rubber Co., New York, N. Y. (Rubber and Rubber lined)
American-Marsh Pumps, Inc., Battle Creek, Mich.
Barnes Mfg. Co., Mansfield, O.
Columbus Steam Pump Wks., Co., Columbus, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Deming Co., Salem, O.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Duro Co., Dayton, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Gardner-Denver Co., Quincy, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Gray Company, Inc., Minneapolis, Minn.
Guild & Garrison, Inc., Brooklyn, N. Y.
Healey Co., Lee, Glendale, Calif.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Ingersoll-Rand Co., New York, N. Y.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Ledeen Mfg. Co., Los Angeles, Calif.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milton Roy Co., Philadelphia, Pa.
Myers & Bro. Co., F. E., The, Ashland, O.
National Steam Pump Co., Upper Sandusky, O.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Perry Co., Waco, Tex.
Royalton Co., Inc., Gasport, N. Y.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Uniflow Mfg. Co., Erie, Pa.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Whitewater Pump Co., Inc., Whitewater, Wis.
Worthington Corp., Harrison, N. J.

PUMPS, ROTARY

American Engineering Co., Philadelphia, Pa.
American Hard Rubber Co., New York, N. Y. (Rubber and rubber lined)
Beach-Russ Co., New York, N. Y.
Blackmer Pump Co., Grand Rapids, Mich.
Bowser, Inc., Fort Wayne, Ind.
Bump Pump Co., La Crosse, Wis.
Chicago Pneumatic Tool Co., New York.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Duriron Co., Inc., The, Dayton, O. (Acid resisting)
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries, Inc., Hamden, Conn.
Eco Engineering Co., Newark, N. J.
Fairbanks, Morse & Co., Chicago, Ill.
Foster Pump Wks., Inc., Brooklyn, N. Y.
Gelber Co., Samuel S., Chicago, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Gray Co., Inc., Minneapolis, Minn.
Hypro Engineering Co., Minneapolis, Minn.
Jabsco Pump Co., Burbank, Calif.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Leiman Bros., Inc., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Madden Corp., Chicago, Ill.
Marco Co., Inc., Saginaw, Mich.
May Oil Burner Div., May Fuel Oil Corp., Baltimore, Md.
Nash Engineering Co., South Norwalk, Conn.
Oberdorfer Foundries, Inc., Syracuse, N. Y.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Robbins & Myers, Inc., Springfield, O.
Roots-Connersville Blower Div., Connersville, Ind.
Roper Corp., Geo. D., Rockford, Ill.
Roth Co., Roy E., Rock Island, Ill.
St. Louis Tool Co., St. Louis, Mo.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Sundstrand Machine Tool Co., Hydraulic Div., Rockford, Ill. (for oil burners)
Taber Pump Co., Buffalo, N. Y.
Trimount Rotary Power Co., Dedham, Mass.
Tuthill Pump Co., Chicago, Ill.
Vanton Pump and Equipment Corp., New York, N. Y.
Viking Pump Co., Cedar Falls, Ia.
Waukesha Foundry Co., Waukesha, Wis.
Webster Electric Co., Racine, Wis.
Worthington Corp., Harrison, N. J.
Yale & Towne Mfg. Co., Stamford, Conn.

PUMPS, SEWAGE AND SLUDGE

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
American Well Works, Aurora, Ill.
Aurora Pump Co., Aurora, Ill.
Barnes Manufacturing Co., Mansfield, O.
Berkeley Pump Co., Berkeley, Calif.
Buffalo Pumps, Inc., Buffalo, N. Y.
Chicago Pump Co., Chicago, Ill.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davidson Co., M. T., New York, N. Y.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Gorman-Rupp Industries, Inc., Belleville, O.
Guild & Garrison, Inc., Brooklyn, N. Y.
Healey Co., Lee, Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
Kingsford Foundry & Machine Works, Oswego, N. Y.
Lawrence Pumps, Inc., Lawrence, Mass.
Marlow Pumps, Subsidiary of Bell & Gossett Co., Ridgewood, N. J.
Morris Machine Wks., Baldwinsville, N. Y.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Robbins & Myers, Inc., Springfield, O.
Swaby Mfg. Co., Chicago, Ill.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, SEWAGE AND SLUDGE, SUBMERSIBLE

American Well Wks., Aurora, Ill.
Chicago Pneumatic Tool Co., New York.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Gelber Co., Samuel S., Chicago, Ill.
Lawrence Pumps, Inc., Lawrence, Mass.
Weil Pump Co., Chicago, Ill.

PUMPS, STEAM

American-Marsh Pumps, Inc., Battle Creek, Mich.
Columbus Steam Pump Wks. Co., Columbus, O.
Coffin Co., J. S., Jr., Englewood, N. J.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Gardner-Denver Co., Quincy, Ill.
Guild & Garrison, Inc., Brooklyn, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
National Steam Pump Co., Upper Sandusky, O.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Worthington Corp., Harrison, N. J.

PUMPS, SUMP

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Aurora Pump Co., Aurora, Ill.
Barnes Mfg. Co., Mansfield, O.
Barrett, Haentjens & Co., Hazleton, Pa.
Berkeley Pump Co., Berkeley, Calif.
Bruner Corp., Milwaukee, Wis.
Buffalo Pumps, Inc., Buffalo, N. Y.
Byron Jackson Co., Los Angeles, Calif.
Chicago Pneumatic Tool Co., New York.
Chicago Pump Co., Chicago, Ill.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Dayton Electric Mfg. Co., Chicago, Ill.
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
Duro Co., Dayton, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Eastern Industries, Inc., Hamden, Conn.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Everite Pump & Mfg. Corp., Lancaster, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Frederick Iron & Steel Inc., Frederick, Md.
Friermood Machine Works, Converse, Ind.
Gardner-Denver Co., Quincy, Ill.
Gelber Co., Samuel S., Chicago, Ill.
Gorman-Rupp Industries, Inc., Belleville, O.
Goulds Pump, Inc., Seneca Falls, N. Y.
Guild & Garrison, Inc., Brooklyn, N. Y.
Healey Co., Lee., Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Kenco Pump Co., Lorain, O.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
Kol-Master Corp., Oregon, Ill
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pumps, Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Marlow Pumps, Subsidiary of Bell & Gossett Co., Ridgewood, N. J.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Morris Machine Wks., Baldwinsville, N. Y.
Myers & Bro. Co., F. E., The, Ashland, O.
Noera Mfg. Co., Div., Chase Brass & Copper Co., Waterbury, Conn.
Oxygen Equipment & Service Co., Chicago 20, Ill.
Pacific Pumping Co., Oakland, Calif.
Palmer Electric Co., Inc., Detroit, Mich.
Peerless of America, Inc., Chicago, Ill.
Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Perry Co., Waco, Tex.
Peters-Dalton, Inc., Detroit, Mich.
Quiet-Heet Mfg. Corp., Newark, N. J.
Radiant Utilities Corp., Brooklyn, N. Y.
Robbins & Myers, Inc., Springfield, O.
Roth Co., Roy E., Rock Island, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skidmore Corp., St. Joseph, Mich.
Standard Electric Mfg. Co., West Berlin, N. J.
Swaby Mfg. Co., Chicago, Ill.
Taber Pump Co., Buffalo, N. Y.
Thor Power Tool Co., Aurora, Ill.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Uniflow Mfg. Co., Erie, Pa.
Union Steam Pump Co., Battle Creek, Mich.

Universal Mfg. Co., Berkeley, Calif.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Wade Mfg. Co., Elgin, Ill.
Warren Steam Pump Co., Inc., Warren, Mass.
Weil Pump Co., Chicago, Ill.
Weinman Pump Mfg. Co., The, Columbus, O.
Whitewater Pump Co., Inc., Whitewater, Wis.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, SUMP, SUBMERSIBLE

Aurora Pump Co., Aurora, Ill.
Byron Jackson Co., Los Angeles, Calif.
Dayton Electric Mfg. Co., Chicago, Ill
Decatur Pump Co., Decatur, Ill.
Deming Co., Salem, O.
Fairbanks, Morse & Co., Chicago, Ill.
Gelber Co., Samuel S., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Kenco Pump Co., Lorain, O.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Lawrence Pumps, Inc., Lawrence, Mass.
Milton Roy Co., Philadelphia, Pa.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Myers & Bro. Co., F. E., The, Ashland, O.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Roth Co., Roy E., Rock Island, Ill.
Swaby Mfg. Co., Chicago, Ill.
Universal Mfg. Co., Berkeley, Calif.
Weil Pump Co., Chicago, Ill.

PUMPS, TURBINE TYPE

Aurora Pump Co., Aurora, Ill.
Coffin Co., J. S., Jr., Englewood, N. J.
Eagan Co., Inc., Walter H. Philadelphia, Pa.
Fairbanks, Morse & Co., Chicago, Ill.
Gelber Co., Samuel S., Chicago, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnston Pump Co., Pasadena, Calif.
Lancaster Pump & Mfg. Co., Lancaster, Pa.
Pacific Pumping Co., Oakland, Calif.
Peerless Pump Div., Food Machinery & Chem. Corp., Los Angeles, Calif.
Skidmore Corp., St. Joseph, Mich.

PUMPS, VACUUM

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Barrett, Haentjens & Co., Hazleton, Pa.
Beach-Russ Co., New York, N. Y.
Bury Compressor Co., Erie, Pa.
Chicago Pneumatic Tool Co., New York, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Daigger & Co., A., Chicago, Ill.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham Co., C. A., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Eisler Engineering Co., Inc., Newark, N. J.
Electric Sprayit Div., Thomas Industries, Inc., Sheboygan, Wis.
Foster Pump Wks., Inc., Brooklyn, N. Y.
Foster Wheeler Corp., New York, N. Y.
Fuller Co., Catasaqua, Pa.
Gardner-Denver Co., Quincy, Ill.
Gelber Co., Samuel S., Chicago, Ill.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (Chemical stoneware, and porcelain)
Guild & Garrison, Inc., Brooklyn, N. Y.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Joy Mfg. Co., Pittsburgh, Pa.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lammert & Mann Co., Chicago, Ill.
Leiman Bros., Inc., Newark, N. J.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Nash Engineering Co., South Norwalk, Conn.
National Steam Pump Co., Upper Sandusky, O.
Oxygen Equipment & Service Co., Chicago, Ill.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Research Vacuum Supply Co., Chicago, Ill.
Roots-Connersville Blower Div., Connersville, Ind.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Skidmore Corp., St. Joseph, Mich.
Stokes Machine Co., F. J., Philadelphia, Pa.
Trimount Rotary Power Co., Dedham, Mass.
Viking Pump Co., Cedar Falls, Ia.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Will Corp., Rochester, N. Y.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUMPS, VACUUM HEATING

American Hydrovac, Div. Pitz Foundry, Inc., Brooklyn, N. Y.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Chicago Pump Co., Chicago, Ill.
Columbus Steam Pump Wks. Co., Columbus, O.
Davidson Co., M. T., New York, N. Y.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Dunham Co., C. A., Chicago, Ill.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Faber Engineering Co., Inc., Philadelphia, Pa.
Gardner-Denver Co., Quincy, Ill.
Guild & Garrison, Inc., Brooklyn, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Nash Engineering Co., South Norwalk, Conn.
Skidmore Corp., St. Joseph, Mich.
Sterling, Inc., Milwaukee, Wis.
Union Steam Pump Co., Battle Creek, Mich.
Warren Steam Pump Co., Inc., Warren, Mass.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.

PUMPS, VISCOUS LIQUIDS AND HEAVY MATERIALS

Aldrich Pump Co., Allentown, Pa.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American-Marsh Pumps, Inc., Battle Creek, Mich.
Beach-Russ Co., New York, N. Y.
Blackmer Pump Co., Grand Rapids, Mich.
Buffalo Pumps, Inc., Buffalo, N. Y.
Bump Pump Co., La Crosse, Wis.
C C Pump Mfg. Div., Palmyra, N. J.
Chicago Pump Co., Chicago, Ill.
Columbus Steam Pump Wks. Co., Columbus, O.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Davidson Co., M. T., New York, N. Y.
Dean Brothers Pumps, Inc., Indianapolis, Ind.
De Laval Steam Turbine Co., Trenton, N. J.
Deming Co., Salem, O.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Engineer Co., New York, N. Y.
Fairbanks, Morse & Co., Chicago, Ill.
Foster Pump Wks., Inc., Brooklyn, N. Y.
Frederick Iron & Steel Inc., Frederick, Md.
Gardner-Denver Co., Quincy, Ill.
Gelber Co., Samuel S., Chicago, Ill.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Gray Co., Inc., Minneapolis, Minn.
Guild & Garrison, Inc., Brooklyn, N. Y.
Healey Co., Lee, Glendale, Calif.
Ingersoll-Rand Co., New York, N. Y.
Jabsco Pump Co., Burbank, Calif.
Jacuzzi Bros., Inc., Richmond, Calif.
Kingsford Foundry & Machine Wks., Oswego, N. Y.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lawrence Pumps, Inc., Lawrence, Mass.
Lawrence Pump & Engine Co., Lawrence, Mass.
Leyman Mfg. Corp., John H. McGowan Co., Div., Cincinnati, O.
Madden Corp., The, Chicago, Ill.
Marco Co., Inc., Saginaw, Mich.
Milton Roy Co., Philadelphia, Pa.
Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Perry Co., Waco, Texas
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Robbins & Myers, Inc., Springfield, O.
Rockwell Co., W. S., Fairfield, Conn.
Roots-Connersville Blower Div., Connersville, Ind.
Roper Corp., Geo. D., Rockford, Ill.
Royalton Co., Inc., Gasport, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Taber Pump Co., Buffalo, N. Y.
Tuthill Pump Co., Chicago, Ill.
Union Steam Pump Co., Battle Creek, Mich.
Vanton Pump & Equipment Corp., New York.
Viking Pump Co., Cedar Falls, Ia.
Warren Steam Pump Co., Inc., Warren, Mass.
Whittington Pump & Engineering Corp., Indianapolis, Ind.
Worthington Corp., Harrison, N. J.
Yeomans Bros. Co., Melrose Park, Ill.

PUNCHES, SHEET METAL

Blackhawk Mfg. Co., Milwaukee, Wis.
Callahan Can Machine Co., Inc., Brooklyn.
Champion Blower & Forge Co., Lancaster, Pa.
Cleveland Punch & Shear Wks. Co., Cleveland, O.
Diamond Machine Tool Co., Pico, Calif.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.
Heartley Machine & Tool Co., Toledo, O.
Hendley & Whittemore Co., Beloit, Wis.
Henry & Wright, Div. of Emhart Mfg. Co., Hartford, Conn.
Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Leslie Welding Co., Inc., Chicago, Ill.
M-M-A, Inc., Lancaster, Pa.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Perkins Machine Co., Warren, Mass.
Reiner & Campbell Co., Inc., Newark, N. J.
Swaine Mfg. Co., Fred J., St. Louis, Mo.
Thor Tool & Die Co., San Leandro, Calif.
Webb Corp., The, Webb City, Mo.
Whitney Mfg. Co., W. A., Rockford, Ill.
Whitney Metal Tool Co., Rockford, Ill.
Weidemann Machine Co., Phialdelphia, Pa.
Zeh & Hahnemann Co., Newark, N. J.

PURGERS, REFRIGERANT GAS

Armstrong Machine Works, Three Rivers, Mich.
Frick Co., Waynesboro, Pa.
Mueller Brass Co., Port Huron, Mich.
Reco Products Div., Recony Corp., New York, N. Y.
Vilter Mfg. Co., Milwaukee, Wis.
York Corp., York, Pa.

PUSHERS, PIPE, HYDRAULIC

Blackhawk Mfg. Co., Milwaukee, Wis.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Giant Mfg. Co., Council Bluffs, Ia.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.

RACKS, STORAGE, PIPE

Adams Co., The, Dubuque, Ia.
Berger Mfg. Div., Republic Steel Corp., Canton, Ohio
Unistrut Products Co., Chicago, Ill.

RADIANT HEAT MEASUREMENT
See Radiometers

RADIANT HEAT THERMOSTATS
See Thermostats, Radiant Heat

RADIANT HEATING AND COOLING
See Coils and Panels, Radiant Heating, Prefabricated

RADIANT HEATING ELECTRICAL CONDUCTORS
See Conductors, Electrical, for Radiant Heating

RADIATION, BASEBOARD
For special fittings, see Fittings, Pipe, Special, for Baseboard Radiation

RADIATION, BASEBOARD, FERROUS

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Argo Sales, Hartford, Conn.
Autorad Inc., Chicago, Ill.
Baseline Mfg. Co., Minneapolis, Minn.
Brown Products Co., Forest Hills, N. Y.
Burnham Corp., Irvington, N. Y.
Crane Co., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.
Koven & Bro., L. O., Inc., Jersey City, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Slant-Fin Radiator Corp., Brooklyn, N. Y.
Smith Co., Inc., H. B., The, Westfield, Mass.
Sterling Radiator Co., Inc., Westfield, Mass.
Trane Co., The, La Crosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Radiator Corp., Detroit, Mich.
Utica Radiator Corp., Utica, N. Y.
Vulcan Radiator Co., Hartford, Conn.
Waterfilm Boilers, Inc., Jersey City, N. J.
Weil-McLain Co., Michigan City, Ind.

RADIATION, BASEBOARD, NON-FERROUS

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Baseline Mfg. Corp., Minneapolis, Minn.
Beacon-Morris Corp., Boston, Mass.
Brown Products Co., Forest Hills, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Columbia Boiler Co., Pottstown, Pa.
Dewey-Shephard Boiler Co., Indianapolis, Ind.
Dunham Co., C. A., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Ejay Baseboard Mfg. Co., Winsted, Conn.
Farrell Associates, Charles, Valencia, Pa.
Fedders-Quigan Corp., Buffalo, N. Y.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
General Heating Products Co., Philadelphia, Pa.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Huron Boiler Co., Detroit, Mich.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kritzer Radiant Coils, Inc., Chicago, Ill.
National Radiator Co., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Radiant Baseboard Panels, Inc., Newington, Conn.
Radiant-Ray Radiation, Inc., New Britain, Conn.
Rempe Co., Chicago, Ill.
Republic Products Co., Philadelphia, Pa.
Rittling Corp., Buffalo, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Slant-Fin Radiator Corp., Brooklyn, N. Y.
Spi-Rol-Fin Corp., Pequannock, N. J.
Sterling Radiator Co., Inc., Westfield, Mass.
Tenney Engineering, Inc., Union, N. J.
Thermo-Base Div., Gerwin Industries, Michigan City, Ind. (warm air baseboards)
Trane Co., The, La Crosse, Wis.
Tuttle & Bailey, Inc., New Britain, Conn.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Radiator Corp., Detroit, Mich.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Young Radiator Co., Racine, Wis.

RADIATION, CONVECTION TYPE, ELECTRIC HEATING ELEMENT

Electromode Corp., Rochester, N. Y.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Meier Elec. & Mach. Co., Inc., Indianapolis, Ind.
Paley Mfg. Corp., Brooklyn, N. Y.
United States Radiator Corp., Detroit, Mich.
Wesix Electric Heater Co., San Francisco.
Wiegand Co., Edwin L., Pittsburgh, Pa.

RADIATION, CONVECTION TYPE, FERROUS

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Auburn Burner Co., Auburn, Ind.
Autorad Inc., Chicago, Ill.
Brown Fintube Co., The, Elyria, O.
Brown Products Co., Forest Hills, N. Y.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Murray Mfg. Co., D. J., Wausau, Wis.
National Radiator Co., The, Johnstown, Pa.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Tranter Mfg., Inc., Lansing, Mich.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Radiator Corp., Detroit, Mich.
Webster & Co., Warren, Camden, N. J.
Weil-McLain Co., Chicago, Ill.

RADIATION, CONVECTION TYPE, NON-FERROUS

Acme Industries, Inc., Jackson, Mich.
Airtherm Mfg. Co., St. Louis, Mo.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Coils Co., Newark, N. J.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Beacon-Morris Corp., Boston, Mass.
Brown Fintube Co., The, Elyria, O.
Brown Products Co., Forest Hills, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Buffalo, N. Y.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
General Heating Products Co., Philadelphia.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kehm Corp., The, Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Modine Mfg. Co., Racine, Wis.
National Radiator Co., The, Johnstown, Pa.
Nesbitt Inc., John J., Philadelphia, Pa.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Republic Products Co., Philadelphia, Pa.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schemenauer Mfg. Corp., Holland, O.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Tenney Engineering Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Tuttle & Bailey, Inc., New Britain, Conn.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Radiator Corp., Detroit, Mich.
Universal Convector Corp., New York, N. Y.
Vapor Heating Corp., Chicago, Ill.
Webster & Co., Warren, Camden, N. J.
Young Radiator Co., Racine, Wis.

RADIATION, DIRECT

American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Burnham Corp., Irvington, N. Y.
Clow & Sons, James B., Chicago, Ill. (Gas fired)
Crane Co., Chicago, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Murray Mfg. Co., D. J., Wausau, Wis.
National Radiator Co., The, Johnstown, Pa.
Rittling Corp, The, Buffalo, N. Y.
United States Radiator Corp., Detroit, Mich.
Utica Radiator Corp., Utica, N. Y.
Weil-McLain Co., Michigan City, Ind.
Wilson Engineering Corp., Chicago, Ill.

RADIATION, FIN TUBE TYPE

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Coils Co., Newark, N. J.
Auburn Burner Co., Auburn, Ind.
Autorad Inc., Chicago, Ill.
Baseline Mfg. Co., Minneapolis, Minn.
Brown Products Co., Forest Hills, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Dunham Co., C. A., Chicago, Ill.
Edwards Engineering Corp., Pompton Plains, N. J.
Fedders-Quigan Corp., Buffalo, N. Y.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
General Heating Products Co., Philadelphia.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Lee Vine Fin-Tube Radiator Co., Inc., New Haven, Conn.
National Radiator Co., The, Johnstown, Pa.
Nesbitt, Inc., John J., Philadelphia, Pa.
Radiant-Ray Radiation, Inc., Newington, Conn.
Refrigeration Economics Co., Inc., Canton, O.
Rempe Co., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schemenauer Mfg. Corp., Holland, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Shaw-Perkins Mfg. Co., Pittsburgh, Pa.
Slant-Fin Radiator Corp., Brooklyn, N. Y.
Smith Co., Inc., H. B., The, Westfield, Mass.
Stedco Products, Wilkes-Barre, Pa.
Sterling Radiator Co., Inc., Westfield, Mass.
Super Radiator Corp., Minneapolis, Minn.
Trane Co., The, La Crosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Radiator Corp., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.

RADIATOR AND CONVECTOR HUMIDIFIERS
See Humidifiers for Radiators and Convectors

RADIATOR HANGERS
See Hangers or Brackets, Radiator

RADIATOR ORIFICES
See Orifices, Radiator

RADIATOR ORIFICE VALVES
See Valves, Radiator, Orifice

RADIATOR VALVES
See Valves, Radiator

RADIATOR VENT VALVE HUMIDIFIERS
See Humidifiers, Radiator Vent Valve

RADIATORS, ELECTRIC

Burnham Corp., Irvington, N. Y.
Conco Engineering Wks., Div. of H. D. Conkey & Co, Mendota, Ill.
Meco, Inc., Portland, Ore.
ThermoRay Corp., Irvington-On-Hudson, N. Y.
Trent, Inc., Philadelphia, Pa.
Wesix Electric Heater Co., San Francisco.

RADIATORS, GAS FIRED

Clow & Sons, James B., Chicago, Ill.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.

RADIATORS, HUMIDIFYING

Murray Mfg. Co., D. J., Wausau, Wis.

RADIOMETERS, THERMAL, FOR RADIANT HEAT MEASUREMENTS

Beckman & Whitley, Inc., San Carlos, Calif.

RAMS, WATER, FOR CLEANING OUT PIPE LINES

Hydraulic Mfg. Co., Kiel, Wis.

RATCHET WRENCHES

See Wrenches, Ratchet

REAMERS, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp, Greenfield, Mass.
Mueller Co., Decatur, Ill.
Nye Tool Co., Chicago, Ill.
Reed Mfg Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Thor Power Tool Co., Aurora, Ill.
Toledo Pipe Threading Machine Co., Toledo, O.

RECIPROCATING PUMPS

See Pumps, Reciprocating

RECORDER-CONTROLLERS, COMBINED TEMPERATURE AND HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

RECORDER-CONTROLLERS, HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Leeds & Northrup Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

RECORDER-CONTROLLERS, PRESSURE

Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Baldwin-Lima-Hamilton Corp., Philadelphia, Pa.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat Timer Corp., New York, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Power Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

RECORDER-CONTROLLERS, TEMPERATURE

American Instrument Co., Inc., Silver Spring, Md.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Hagan Corp., Pittsburgh, Pa.
Heat Timer Corp., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Pyrometer Instrument Co., Inc., The, Bergenfield, N. J. .
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
West Insturment Corp., Chicago, Ill.
Weston Electrical Instrument Corp., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

RECORDERS, CARBON DIOXIDE

Cole-Sewell Engineering Co., St. Paul, Minn.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Defender Instrument and Regulator Co., St. Louis, Mo.
Engelhard, Inc., Charles, Newark, N. J.
Hays Corp., Michigan City, Ind.
Leeds & Northrup Co., Philadelphia, Pa.
Permutit Co., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J.
Victory Engineering Corp., Union, N. J.

RECORDERS, COMBINED TEMPERATURE AND HUMIDITY

Abbeon Supply Co., Jamaica, N. Y.
American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Thwing-Albert Instrument Co., Philadelphia.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

RECORDERS, DEW POINT

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Surface Combustion Corp., Toledo, O.

RECORDERS, DRAFT

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Republic Flow Meters, Co., Chicago, Ill.
Uehling Instrument Co., Paterson, N. J .
Victory Engineering Corp., Union, N. J.

RECORDERS, HUMIDITY

American Instrument Co., Inc., Silver Spring, Md.
Bristol Co., The, Waterbury, Conn.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Garden City Instruments, Inc., Chicago, Ill.
Leeds & Northrup Co., Philadelphia, Pa.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Powers Regulator Co., Skokie, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

RECORDERS, LIQUID LEVEL

Automatic Control Co., St. Paul, Minn.
Bailey Meter Co., Cleveland, O.
Barton Instrument Corp., Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Defender Instrument & Regulator Co., St. Louis, Mo.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Liquidometer Corp., Long Island City, N. Y.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Republic Flow Meters Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Uehling Instrument Co., Paterson, N. J.
Westinghouse Electric Corp., Pittsburgh, Pa.
Yarnall-Waring Co., Philadelphia, Pa.

RECORDERS, OXYGEN

Bailey Meter Co., Cleveland, O.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., Newark, N. J.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Mine Safety Appliances Co., Pittsburgh, Pa.
Victory Engineering Corp., Union, N. J.

RECORDERS, PRESSURE AND VACUUM

Au-Temp-Co Corp., New York, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Baldwin-Lima-Hamilton Corp., Philadelphia, Pa.

Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fischer & Porter Co., Hatboro, Pa.
Flow Corp., Cambridge, Mass.
Foxboro Co., Foxboro, Mass.
Garden City Instruments, Inc., Chicago, Ill.
Hagan Corp., Pittsburgh, Pa.
Hastings Instrument Co., Inc., Warwick, Va.
Hays Corp., Michigan City, Ind.
Heat Timer Corp., New York, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Stokes Machine Co., F. J., Philadelphia, Pa.
Swartwout Co., The, Cleveland, Ohio
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Uehling Instrument Co., Paterson, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
Weston Electric Instrument Corp., Newark, N. J.

RECORDERS, SMOKE DENSITY

Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Combustion Control Div., Electronics Corp. of America, Boston, Mass.
De-Tec-Tronic Laboratories, Inc., Chicago, Ill.
Edwards, L. V., Rockville Center, N. Y.
Ess Instrument Co., Bergenfield, N. J.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Leeds & Northrup Co., Philadelphia, Pa.
Standard Instrument Corp., New York, N. Y.
Sterns-Flinn Corp., New York, N. Y.

RECORDERS, TEMPERATURE

American Instrument Co., Inc., Silver Spring, Md.
Au-Temp-Co Corp., New York, N. Y.
Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Defender Instrument and Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Engelhard, Inc., Charles, Newark, N. J.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat Timer Corp., New York, N. Y.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Moore Products Co., Philadelphia, Pa.
Palmer Thermometers, Inc., Cincinnati (Norwood), O. (Mercury-actuated)
Penn Industrial Instrument Corp., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Pyrometer Instrument Co., Inc., The, Bergenfield, N. J.
Republic Flow Meters Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
Victory Engineering Corp., Union, N. J.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

RECORDING THERMOMETERS

See Recorders, Temperature

RECOVERY EQUIPMENT, AIR

See Adsorbers, Odor

REDUCERS, SPEED

Abart Gear & Machine Co., Chicago, Ill.
Adams Co., The, Dubuque, Iowa
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Pulley Co., Philadelphia, Pa.
Bodine Electric Co., Chicago, Ill.
Boston Gear Wks., Quincy, Mass.
Brown-Brockmeyer Co., Inc., Dayton, O.
Chicago Die Casting Mfg. Co., Chicago, Ill.
Cleveland Worm & Gear Co., Cleveland, O.
De Laval Steam Turbine Co., Trenton, N. J.
Dodge Mfg. Corp., Mishawaka, Ind.
Falk Corp., Milwaukee, Wis.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Janette Electric Mfg. Co., Morton Grove, Ill.
Jones Foundry & Machine Co., W. A., Chicago, Ill.
Lima Electric Motor Co., The, Lima, O.
Link Belt Co., Chicago, Ill.
Link Belt Co., Philadelphia, Pa.
Medart Co., St. Louis, Mo.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Poole Foundry & Machine Co., Baltimore, Md.
Reliance Electric & Engineering Co., Cleveland, O.
Shallcross Controls, Inc., Milwaukee, Wis.
Star-Kimble Motor Div., Miehle Prntg. Press & Mfg. Co., Bloomfield, N. J.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Stephens-Adamson Mfg. Co., Aurora, Ill.
Sterling Electric Motors, Inc., Los Angeles, Calif.
Terry Steam Turbine Co., The, Hartford, Conn.
U. S. Electrical Motors, Inc., Los Angeles, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.

REFRACTORIES AND REFRACTORY CEMENT

Allen Co., Robert G., Mechanicsville, N. Y.
Armstrong Cork Co., Lancaster, Pa.
Babcock & Wilcox Co., New York, N. Y.
Basic Refractories, Inc., Cleveland, O.
Botfield Refractories Co., Philadelphia, Pa.
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Chicago Fire Brick Co., Chicago, Ill.
Elraco Engineering Co., Los Angeles, Calif.
Fireline Stove & Furnace Lining Co., Chicago, Ill.
France Refractories, Co., J. H., Snow Shoe, Pa.
General Insulating Products Co., Brooklyn, N. Y.
Green Fire Brick Co., Mexico, Mo.
Johns-Manville, New York, N. Y.
Krehbiel Co., J. H., Chicago, Ill.
Laclede-Christy Co., St. Louis, Mo.
Monogram Products Co., Inc., Philadelphia, Pa.
Nebel Mfg. Co., Cleveland, O.
Norton Co., Worcester, Mass.
Peterson Co., B. A., Dowagiac, Mich.
Plibrico Co., Chicago, Ill.
Preferred Utilities Mfg. Corp., New York, N. Y.
Pyrolite Products Co., Cleveland, O.
Quigley Co., Inc, New York, N. Y.
Ramtite Co., The, Chicago, Ill.
Refractory & Insulation Corp., New York, N. Y.
Reintjes Co., Geo. P., Kansas City, Mo.
Rex Clay Products Co., Detroit, Mich.
Rutland Fire Clay Co., Rutland, Vt.
S.O.S. Products Co, Inc., Brooklyn, N. Y
Saverite Engineering Co., Hoboken, N. J.
Standard Fuel Engineering Co., Detroit, Mich.
Taylor Sons Co., Charles, Cincinnati, O.
United States Stoneware Co., New York, N. Y.
Walsh Refractories Corp., St. Louis, Mo.
Zonolite Co., Chicago, Ill.

REFRIGERANT DEHYDRATORS

See Dehydrators, Refrigerant

REFRIGERANT FILTERS

See Filters, Refrigerant

REFRIGERANT GAS PURGERS

See Purgers, Refrigerant Gas

REFRIGERANT SLUG ELIMINATORS

See Eliminators, Slug, Refrigerant

REFRIGERANTS

American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif. (sulphur dioxide methyl chloride)
Ansul Chemical Co., Refrigeration Div., Marinette, Wis. (methyl chloride, sulphur dioxide)
Armour and Co., Ammonia Div., Chicago, Ill. (Anhydrous ammonia)
Dow Chemical Co., The, Midland, Mich.
du Pont de Nemours & Co., Inc., E. I., Kinetic Chemicals Div., Wilmington, Del. ("Freon" fluorinated hydro carbon refrigerants)
du Pont de Nemours & Co., Inc., E. I., Electrochemicals Dept., Wilmington, Del. (Methyl chloride and methylene chloride)
General Chemicals Div., Allied Chemical & Dye Corp., New York, N. Y. (Trichloromonofluromethane and dichlorodifluromethane)
Liquid Carbonic Corp., Chicago, Ill. (carbon dioxide)
Monsanto Chemical Co., Merimac Div., Boston, Mass. (anhydrous ammonia)
Pennsylvania Salt Mfg. Co., Philadelphia, Pa. (ammonia)
Pure Carbonic Co., Div. of Air Reduction Co., Inc., New York, N. Y. (carbon dioxide)
Solvay Process Div., Allied Chemical & Dye Corp., New York, N. Y.
Virginia Smelting Co., West Norfolk, Va., (Methyl chloride, liquid sulphur dioxide.)

REFRIGERATING COMPRESSORS

See Compressors, Refrigerating

REFRIGERATION ACCUMULATORS

See Accumulators, Refrigeration

REFRIGERATION CONTROLS

See Valves, Refrigeration

REFRIGERATION FITTINGS

See Fittings, Refrigeration

REFRIGERANT GAGE SETS

See Gage Sets, Refrigeration

REFRIGERATION MANIFOLDS

See Manifolds, Refrigeration

REFRIGERATION VALVES

See Valves, Refrigeration

REGISTERS

See also Diffusers; Grilles; Panels, Perforated, for Air Diffusion

A. & A. Register Co., Cleveland, O.
A-J Mfg. Co., Kansas City, Mo.
Air Control Products, Inc., Coopersville, Mich.
Air-Factors, Inc., Monrovia, Calif.
Auer Register Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Best Register Co., Milwaukee, Wis.
Char-Gale Mfg. Co., Minneapolis, Minn.
Controlair Mfg. Co., Los Angeles, Calif.
Diamond Mfg. Co., Wyoming, Pa.
Dole Valve Co., The, Chicago, Ill. (Automatic register)
Don Mfg. Co., Chicago, Ill.

Empire Ventilation Equipment Co., Long Island City, N. Y.
General Register Corp., Cedar Grove, N. J.
Harrington & King Perforating Co., Chicago, Ill.
Hart & Cooley Mfg. Co., Holland, Mich.
Hastings Air Conditioning Co., Hastings, Neb.
Hendrick Mfg. Co., Carbondale, Pa.
Independent Register Co., Cleveland, O.
Krueger Air Conditioning Co., Tucson, Ariz.
Lima Register Co., The, Lima, O.
Louvra Corp., The, Union, N. J.
Martin Metal Products Corp., Ferndale, Mich.
Midco Register Corp., St. Paul, Minn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Patco Mfg. Co., Philadelphia, Pa.
Pennant Corp., Grand Rapids, Mich.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Rock Island Register Co., Rock Island, Ill.
Smith Co., J. B., Philadelphia, Pa.
Standard Stamping & Perforating Co., Chicago, Ill.
Stewart Mfg. Co., Inc., Cedar Grove, N. J.
Thermo-Base Div., Gerwin Industries, Michigan City, Ind.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Inc., New Britain, Conn.
United States Register Co., Battle Creek, Mich.
Viking Mfg. Corp., Cleveland, O.
Waterloo Register Co., Waterloo, Ia.
Young Regulator Co., Cleveland, O.

REGISTER UNITS, FOR SECONDARY AIR SUPPLY FOR OIL BURNERS

Faber Engineering Co., Philadelphia, Pa.
Radiant Combustion System, Inc., New York, N. Y.

REGULATORS, AIR VELOCITY

Barber-Colman Co., Rockford, Ill.
General Register Corp., Cedar Grove, N. J.
Hastings Instrument Co., Inc., Warwick, Va.
Hays Corp., Michigan City, Ind.
Johnson Service Co., Milwaukee, Wis.
Shallcross Controls, Inc., Milwaukee, Wis.
Taylor Instrument Companies, Rochester, N. Y.
Thermal Agency, Houston, Tex.

REGULATORS, DAMPER SETS

Acme Mfg. Co., Philadelphia, Pa.
Acro Mfg. Co., The, Columbus, O.
Adams Co., The, Dubuque, Ia.
Ashcraft Co., J. P., Dallas, Tex.
Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Crown Controls Co., Inc., New Bremen, O.
Detroit Controls Corp., Detroit, Mich.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Elgin Mfg. Co., Long Island City, N. Y.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Fossum, M. H., St. Paul, Minn.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Gerett Corp., M. A., Milwaukee, Wis.
Hart & Cooley Mfg. Co., Holland, Mich.
Kerentoff, G. L., Cincinnati, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Powers Regulator Co., Skokie, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Shallcross Controls, Inc., Milwaukee, Wis.
Soreng Products Corp., Schiller Park, Ill.
Thermal Agency, Houston, Tex.
United States Register Co., Battle Creek, Mich.
Wa-Trol, Houston, Tex.
Young Regulator Co., Cleveland, O.

REGULATORS, DRAFT, COMBUSTION

A-P Controls Corp., Milwaukee, Wis.
Askania Regulator Co., Chicago, Ill.
Automatic Devices Co., Inc., Western Springs, Ill.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cash Co., A. W., Decatur, Ill.
Cleveland Fuel Equipment Co., Cleveland, O.
Cole-Sewell Engineering Co., St. Paul, Minn.
Combustion Equipment Co., Silvis, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
Engineer Co., New York, N. Y.
Engineered Products Co., Philadelphia, Pa.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Foster Wheeler Corp., New York, N. Y.
Foxboro Co., Foxboro, Mass.
Fuel Reduction Corp., Chicago, Ill.
Fuelguard Co., Dallas, Tex.
General Blower Co., Inc., Philadelphia, Pa.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kol-Master Corp., Oregon, Ill.
Krueger Sentry Gauge Co., Green Bay, Wis.
Leahy Mfg. Co., Los Angeles, Calif.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Regulator Co., Boston, Mass.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nichols Instrument Co., Baltimore, Md.
Perfex Corp., Milwaukee, Wis.
Preferred Utilities Mfg. Corp., New York, N. Y.
Republic Flow Meters Co., Chicago, Ill. (Industrial)
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.
Simplex Mfg. Co., Fond du Lac, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Standard Instrument Corp., New York, N. Y.
Webster Engineering Co., Tulsa, Okla.

REGULATORS, FLUID FLOW, FOR CONSTANT VOLUME

Independent of Pressure

A-P Controls Corp., Milwaukee, Wis.
Askania Regulator Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Cla-Val Co., Alhambra, Calif.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hays Corp., Michigan City, Ind.
Kates Co., W. A., The, Deerfield, Ill.
Klipfel Valves, Inc., Hamilton, O.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Taco Heaters, Inc., Cranston, R. I.

REGULATORS, LEVEL, LIQUID

Alco Valve Co., St. Louis, Mo.
Askania Regulator Co., Chicago, Ill.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Control Co., St. Paul, Minn.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Burrows Mfg. Co., F. A., York, Pa.
Cla-Val Co., Alhambra, Calif.
Cooper Co., Clark, Palmyra, N. J.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument & Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Griscom-Russell Co., The, Massillon, O.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Instruments, Inc., Tulsa, Okla.
Johnson Corp., The, Three Rivers, Mich.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Magnetrol, Inc., Chicago, Ill.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Newark Controls Co., Bloomfield, N. J.
Penn Controls, Inc., Goshen, Ind.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Sarco Co., Inc., New York, N. Y.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thermo Instruments Co., Belmont, Calif.
Trimount Instrument Co., Chicago, Ill.
United Electric Controls Co., Watertown, Mass.

REGULATORS, PRESSURE, AIR

Air Conversion Research Corp., Chicago, Ill.
American Meter Co., Inc., Philadelphia, Pa.
Askania Regulator Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Binks Mfg. Co., Chicago, Ill.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia.
Burrows Mfg. Co., F. A., York, Pa.
CCA Products, Inc., Glendale, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Conoflow Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
DeVilbiss Co., The, Toledo, O.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
Greiner Co., Emil, New York, N. Y.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Regulator Corp., Cincinnati, O.
Keckley Co., O. C., Chicago, Ill.

Keller Tool Co., Grand Haven, Mich.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Nielan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Monitor Controller Co., The, Boston, Mass.
Moore Products Co., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
National Cylinder Gas Co., Chicago, Ill.
Norgren Co., C. A., Englewood, Colo.
North Penn Co., New York, N. Y.
Norwalk Valve Co., Norwalk, Conn.
Paasche Airbrush Co., Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Spray Engineerig Co., Somerville, Mass.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Strong, Carlisle & Hammond Co., Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Tryco Products, Inc., Westfield, Mass.
United Electric Controls Co., Watertown, Mass.
Universal Controls Corp., Dallas, Tex.
Warren Engineering Co., Broadway, N. J.
Water Cooling Corp., New York, N. Y.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., Newark, N. J.
Young Regulator Co., Cleveland, O.

REGULATORS, PRESSURE, GAS

American Meter Co., Inc., Philadelphia, Pa.
Askania Regulator Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Conoflow Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Greiner Co., Emil, New York, N. Y.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Harris Calorific Co., The, Cleveland, O.
Hays Corp., Michigan City, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Industrial Gas Div., Liquid Carbonic Corp., Chicago, Ill.
Jordan Regulator Corp., Cincinnati, O.
Keckley Co., O. C., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Liquid Carbonic Corp., The, Chicago, Ill.
Mason-Neilan Regulator Co., Boston, Mass.
Maxitrol Co., Detroit, Mich.
McAlear Mfg. Co., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Monitor Controller Co., The, Boston, Mass.
Moore Products Co., Philadelphia, Pa.
Mueller Co., Decatur, Ill.
Mueller Climatrol, Milwaukee, Wis.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
National Cylinder Gas Co., Chicago, Ill.
Norgren Co., C. A., Englewood, Colo.
North American Mfg. Co., Cleveland, O.
Norwalk Valve Co., South Norwalk, Conn.
Penn Controls, Inc., Goshen, Ind.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Positive Control Co., The, Cincinnati, O.
Republic Flow Meters Co., Chicago, Ill. (Industrial)
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Strong, Carlisle & Hammond Co., Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thermac Co., Los Angeles, Calif.
Trerice Co., H. O., Detroit, Mich.
United Electric Controls Co., Watertown, Mass.
Universal Controls Corp., Dallas, Tex.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Weston Electrical Instrument Corp., Newark, N. J.

REGULATORS, PRESSURE, HOT WATER HEATING SYSTEMS

Bailey Co., Chas., M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Burrows Mfg. Co., F. A., York, Pa.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chicago Specialty Mfg. Co., Chicago, Ill.
Clark Mfg. Co., Cleveland, O.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Detroit Controls Corp., Detroit, Mich.
Fisher Governor Co., Marshalltown, Ia.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Regulator Corp., Cincinnati, O.
Kainer and Co., Chicago, Ill.
Keckley Co., O. C., Chicago, Ill.
Kehm Corp., The, Chicago, Ill.
Klipfel Valves, Inc., Hamilton, O.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Mueller Co., Decatur, Ill.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
White-Rodgers Electric Co., St. Louis, Mo.
Yula Water Heaters Inc., New York, N. Y.

REGULATORS, PRESSURE, LIQUID

Askania Regulator Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Automatic Control Co., St. Paul, Minn.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Controller Co., Cleveland, O.
Cla-Val Co., Alhambra, Calif.
Conoflow Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Daytronic Corp., Dayton, O.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eddington Metal Specialty Co., Eddington, Pa.
Electric Sprayit Div., Thomas Industries, Inc., Sheboygan, Wis.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Healy Ruff Co., St. Paul, Minn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Johnson Service Co., Milwaukee, Wis.
Jordan Regulator Corp., Cincinnati, O.
Justus Steam Trap Co., Napanoch, N. Y.
Keckley Co., O. C., Chicago, Ill.
Kieley & Mueller, Inc, Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Monitor Controller Co., The, Boston, Mass.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Newark Controls Co., Bloomfield, N. J.
Norgren Co., C. A., Englewood, Colo.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Chicago, Ill.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond Co., Cleveland, O.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.

Tryco Products, Inc., Westfield, Mass.
United Electric Controls Co., Watertown Mass.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Water Cooling Corp., New York, N. Y.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., Newark, N. J.
White-Rodgers Electric Co., St. Louis, Mo.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (Feed water)

REGULATORS, STATIC PRESSURE, AIR DUCT

Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cooper Co., Clark, Palmyra, N. J.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Daytronic Corp., Dayton, O.
Hays Corp., Michigan City, Ind.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Shallcross Controls, Inc., Milwaukee, Wis.

REGULATORS, TEMPERATURE

A-P Controls Corp., Milwaukee, Wis.
Acro Mfg. Co., The, Columbus, O.
Aerco Corp., Northvale, N. J.
American Instrument Co., Inc., Silver Spring, Md.
Atlas Valve Co., Newark, N. J.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Burling Instrument Co., Chatham, N. J.
Century Instrument Co., Detroit, Mich.
Conoflow Corp., Dept. P, Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Crown Controls Co., Inc., New Bremen, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Detroit Controls Corp., Detroit, Mich.
Eastern Industries, Inc., Hamden, Conn.
Eclipse Fuel Engineerig Co., Rockford, Ill.
Farris Stacon Corp., Palisades Park, N. J.
Fenwal Inc., Ashland, Mass.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Gleason-Avery, Inc., Auburn, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Heat Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Jordan Regulator Corp., Cincinnati, O.
Keckley Co., O. C., Chicago, Ill.
Klipfel Valves, Inc., Hamilton, O.
Lawler Automatic Controls, Inc., Mount Vernon, N. Y.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
McAlear Mfg. Co., Chicago, Ill.
McCorkle Co., D. H., Berkeley, Calif.
McDonnell & Millers, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Penn Controls, Inc., Goshen, Ind.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Perfex Corp., Milwaukee, Wis.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Co., Skokie, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Pyrometer Instrument Co., Inc., The, Bergenfield, N. J.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc, New York, N. Y.
Scaico, Inc., Palmyra, N. J.
Scientific Instrument Co., Detroit, Mich.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Superior Controls Co., Inc., Los Angeles, Calif.
Swartwout Co., The, Cleveland, O.
Tallmadge System, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., Newark, N. J.
West Instrument Corp., Chicago, Ill.
Wheelco Instruments Co., Chicago, Ill.
White-Rodgers Electric Co., St. Louis, Mo.

RELAYS, ELECTRICAL

A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J. (time delay)
Advance Electric and Relay Co., Burbank, Calif.
Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Allen-Bradley Co., Milwaukee, Wis.
Allied Control Co., Inc., New York, N. Y.
American Instrument Co., Inc., Silver Spring, Md.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Au-Temp-Co Corp., New York, N. Y.
Automatic Electric Mfg. Co., Mankato, Minn.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Clark Controller Co., Cleveland, O.
Consolidated Metal Products Corp., Albany, N. Y.
Cook Electric Co., Chicago, Ill.
Cooper Co., Clark, Palmyra, N. J.
Cutler-Hammer, Inc., Milwaukee, Wis.
Daytronic Corp., Dayton, O.
Detroit Controls Corp., Detroit, Mich.
Durakool, Inc., Elkhart, Ind.
Ebert Electronics Corp., Queens Village, N. Y.
Edison, Inc., Thos. A., Instrument Div., West Orange, N. J.
Electro-Switch & Controls Inc., Culver City, Calif.
Ess Instrument Co., Bergenfield, N. J.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
Hart Mfg. Co., The, Hartford, Conn.
H-B Instrument Co., Philadelphia, Pa.
Heinemann Electric Co., Trenton, N. J.
Industrial Engineering Corp., Terre Haute, Ind.
Leach Relay Co., Los Angeles, Calif.
McCorkle Co., D. H., Berkeley, Calif.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monitor Controller Co., The, Boston, Mass.
National Time & Signal Corp., Detroit, Mich.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Philadelphia Thermometer Co., Philadelphia.
Potter & Brumfield Sales Co., Princeton, Ind.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass. (motor starting relays)
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Struthers-Dunn, Inc., Pitman, N. J.
Synchro-Start Products, Inc., Skokie, Ill.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis.
Thermo Instruments Co., Belmont, Calif.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Vapor Heating Corp., Chicago, Ill.
Ward Leonard Electric Co., Mt. Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
Weston Electrical Instrument Corp., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
White-Rodgers Electric Co., St. Louis, Mo.
Zenith Electric Co., Chicago, Ill.

RELAYS, PNEUMATIC

Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Conoflow Corp., Dept, P, Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
Hagan Corp., Pittsburgh, Pa.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moore Products Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.

RELIEF VALVES

See Valves, Relief

REPAIR CLAMPS

See Clamps, Pipe Repair

REPAIR PLUGS FOR TANKS

See Plugs, Repair, for Tanks

RESEATERS, VALVE

Chicago Specialty Mfg. Co., Chicago, Ill.
Economy Valve Seat Co., Chicago, Ill.
Leavitt Machine Co., Orange, Mass.
Skinner Co., M. B., South Bend, Ind.
Standard Reseater Corp., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Thor Power Tool Co., Aurora, Ill.

REVERSE REFRIGERATION CYCLE UNITS

See Units, Air Conditioning, Reverse Refrigeration Cycle

RINGS, PISTON, FOR COMPRESSORS

Double Seal Ring Co., Fort Worth, Tex.
Koppers Company, Inc., Metal Products Div., Baltimore, Md.
Maloney Co., F. H., Houston, Tex.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Perfect Circle Corp., Hagerstown, Ind.
Sealed Power Corp., Muskegon, Mich.

RINGS, WELDING

All-State Welding Alloys Co., Inc., White Plains, N. Y.
Arcos Corp., Philadelphia, Pa.
Grinnell Co., Inc., Providence, R. I.
Midwest Piping Co., Inc., St. Louis, Mo.
Robvon Backing Ring Co., Elizabeth, N. J.
Tube Turns, A Div. of National Cylinder Gas. Co., Louisville, Ky.
Wedge Protectors, Inc., Cleveland, O.
Wickwire Spencer Steel, Div., of Colorado Fuel & Iron Corp., New York, N. Y.

ROD, GAS WELDING

Air Reduction Sales Co., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alloy Rods Co., York, Pa.

Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
American Steel & Wire Div., United States Steel, Cleveland, O.
Arcos Corp., Philadelphia, Pa.
Atlantic Steel Co., Atlanta, Ga.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chemalloy Associates, Santee, Calif.
Crucible Steel Co. of America, Pittsburgh, Pa.
Dow Chemical Co., The, Midland, Mich.
Duraloy Co., Scottdale, Pa. (Stainless)
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
International Nickel Co., The, New York, N. Y.
K-G Equipment Co., Allentown, Pa.
Linde Air Products Co., The, Unit of Union Carbide & Carbon Corp., New York, N. Y.
Marquette Mfg. Co., Minneapolis, Minn.
Maurath, Inc., Cleveland, O.
Mir-O-Col Alloy Co., Los Angeles, Calif. (for hard facing)
Modern Engineering Co., St. Louis, Mo.
National Cylinder Gas Co., Chicago, Ill.
Page Steel & Wire Division of American Chain & Cable Co., Inc., Monessen, Pa.
Revere Copper and Brass, Incorporated, New York, N. Y.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Youngstown Sheet & Tube Co., Youngstown, O.

ROLLER BEARINGS
See Bearings, Roller

ROOF COOLERS
See Systems, Roof Spraying

ROOF SPRAYING SYSTEMS
See Systems, Roof Spraying

ROOF VENTILATORS
See Ventilators, Roof

ROOM HUMIDIFIERS
See Humidifiers, Unit, Room Type; and Units, Air Conditioning, Winter

ROOM THERMOSTATS
See Thermostats, Room or Wall

ROTARY PUMPS
See Pumps, Rotary

RUBBER BELTING
See Belting, Flat, Rubber

RUBBER PACKING
See Packing, Rubber and Synthetic

RUBBER PIPE
See Pipe, Hard Rubber

SADDLE VALVES
See Valves, Saddle

SADDLE TEES
See Fittings, Pipe, Saddle Tee

SAFETY VALVES
See Valves, Safety, Steam

SCAFFOLDS, PORTABLE
American Ladder & Scaffold Co., Miami, Fla.
Beaver Art Metal Corp., Ellwood City, Pa.
Up-Right Scaffolds, Berkeley, Calif.
Waco Steel Scaffolding, Inc., Waco, Tex.

SCALE CONTROL
See Devices, Electrolytic; Treatment, Steam System; Treatment, Water

SCALE REMOVAL, CHEMICAL SERVICE FOR
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Brown Electro Co., Oklahoma City, Okla. (electrolytic protector)
Chemical Solvent Co., Birmingham, Ala.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Dearborn Chemical Co., Chicago, Ill.
Dowell Inc., Tulsa, Okla.
Evis Corp. of America, Dallas, Tex. (without chemicals)
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Oakite Products, Inc., New York, N. Y.
O'Brien Industries, Caldwell, N. J.

SCOOPS, AIR, FOR DEFLECTING FLOW IN DUCTS
General Register Corp., Cedar Grove, N. J.
Stewart Mfg. Co., Inc., Cedar Grove, N. J.
Titus Mfg. Corp., Waterloo, Ia.
Waterloo Register Co., Inc., Waterloo, Ia.

SCREENS, SUN REFLECTING
Colonial Alloys Co., Metals Div., Philadelphia, Pa.
Kaiser Aluminum & Chemical Corp., Oakland, Calif.
Kane Mfg. Corp., Kane, Pa.
Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.

SCREWS, SHEET METAL
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Aluminum Co. of America, Pittsburgh, Pa.
American Screw Co., Willimantic, Conn.
Continental Screw Co., New Bedford, Mass.
Elco Tool & Screw Corp., Rockford, Ill.
Harper Co., H. M., Morton Grove, Ill.
Industrial Screw Co., Chicago, Ill.
Lamson & Sessions Co., Cleveland, O.
National Lock Co., Inc., Rockford, Ill.
Paine Co., Addison, Ill.
Parker-Kalon Div., General American Transportation Corp., New York, N. Y.
Pheoll Mfg. Co., Chicago, Ill.
Rockford Screw Products Co., Rockford, Ill.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Shakeproof Div., Illinois Tool Wks., Elgin, Ill.
Standard Pressed Steel Co., Jenkintown, Pa.
Star Stainless Screw Co., Paterson, N. J.
United States Register Co., Battle Creek, Mich.

SEALS, SHAFT, MECHANICAL
Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Crane Packing Co., Chicago, Ill.
Federal-Mogul Corp., Detroit, Mich.
Felt Products Mfg. Co., Chicago, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Garlock Packing Co., Palmyra, N. Y.
Johns-Manville, New York, N. Y.
Morganite, Inc., Carbon Specialties Div., Long Island City, N. Y.
Rotary Seal Co., Chicago, Ill.
Schwitzer-Cummins Co., Indianapolis, Ind.
Sealol Corp., Providence, R. I.
Syntron Co., Homer City, Pa.

SEALS, TERMINAL, FOR COMPRESSORS
Minnesota Rubber & Gasket Co., Minneapolis, Minn.
Wolfe Co., Inc., The, Franklin C., Culver City, Calif.

SEAMLESS PIPE
See Pipe, Steel, Seamless

SEPARATORS, AIR
Adams Co., Inc., R. P., Buffalo, N. Y.
Air Conversion Research Corp., Chicago, Ill.
Airlenco, Inc., Mansfield, Ohio.
American District Steam Co., Inc., North Tonawanda, N. Y.
Anderson Co., V. D., The, Cleveland, O.
Automatic Switch Co., Orange, N. J.
Binks Mfg. Co., Chicago, Ill.
Bowser, Inc., Fort Wayne, Ind.
Centrifix Corp., Cleveland, O.
Clark Mfg. Co., Cleveland, O.
Combustion Engineering, Inc., New York, N. Y.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
DeVilbiss Co., The, Toledo, O.
Dollinger Corp., Rochester, N. Y.
Dunham Co., C. A., Chicago, Ill.
Glasflux Co., Mansfield, O.
Hagan Corp., Pittsburgh, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Corp., Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Chicago, Ill.
Kraissl Co., Inc., The, Hackensack, N. J.
Leavitt Machine Co., Orange, Mass.
Logan Engineering Co., Chicago, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Quality Specialty Co., Inc., Camden, N. J.
Spencer Turbine Co., Hartford, Conn.
Spray Engineering Co., Somerville, Mass.
Strong, Carlisle & Hammond Co., Cleveland.
Swartwout Co., The, Cleveland, O.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Watts Regulator Co., Lawrence, Mass.
Wright-Austin Co., Detroit, Mich.

SEPARATORS, FLANGE
Kraissl Co., Inc., The, Hackensack, N. J.
Williams & Co., J. H., Buffalo, N. Y.

SEPARATORS, OIL
Acme Industries, Inc., Jackson, Mich.
Adams Co., Inc., R. P., Buffalo, N. Y.
Air Conversion Research Corp., Chicago, Ill.
Air-Maze Corp., Cleveland, O.
American District Steam Co., Inc., North Tonawanda, N. Y.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Anderson Co., V. D., The, Cleveland, O.
Armstrong Co., Richard M., Westchester, Pa.
Beach Precisions Parts Co., Boonton, N. J.
Boylston Steam Specialty Co., Chicago, Ill.
Centrifix Corp., Cleveland, O. (Gas and Vapor)
Cochrane Corp., Philadelphia, Pa.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Fisher Governor Co., Marshalltown, Ia.
Graver Water Conditioning Co., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hoppes Mfg. Co., Inc., Springfield, O.
Howe Ice Machine Co., Chicago, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Corp., The, Three Rivers, Mich.
Kaye & MacDonald, Inc., West Orange, N. J.
Kieley & Mueller, Inc., Middletown, N. Y.
Kraissl Co., Inc., The, Hackensack, N. J.
Morehead Mfg. Co., Detroit, Mich.
National Valve & Mfg. Co., Pittsburgh, Pa.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Richmond Engineering Co., Inc., Richmond, Va.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Sims Co., Erie, Pa.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond Co., Cleveland, O.
Swartwout Co., The, Cleveland, O.
Temprite Products Corp., Birmingham, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Webster & Co., Warren, Camden, N. J.
Wilson Engineering Corp., Chicago, Ill.
Worthington Corp., Harrison, N. J.
Wright-Austin Co., Detroit, Mich.
York Corp., York, Pa.

SETS, PIPE BIT, FOR BORING HOLES IN WOOD FOR PIPE AND TUBING
Greenlee Tool Co., Div. of Greenlee Bros. & Co., Rockford, Ill.

SEWAGE EJECTORS
See Ejectors, Sewage

SEWAGE PUMPS
See Pumps, Sewage

SHAFT SEALS, MECHANICAL
See Seals, Shaft, Mechanical

SHAFTS, FLEXIBLE, PUSH-PULL, FOR CONTROL

Anderson & Co., Inc., Sioux City, Ia.
Arena Controls, Inc., Evanston, Ill.
Healey Co., Lee, Glendale, Calif.
Imperial Brass Mfg. Co., Chicago, Ill.
Piezo Mfg. Corp., New York, N. Y.
Stow Mfg. Co., Binghamton, N. Y.

SHEARS, ELECTRICAL, PORTABLE

Black & Decker Mfg. Co., Towson, Md.
G. D. S. Machinery & Supply Co., Inc., New York, N. Y.
M-M-A, Inc., Lancaster, Pa.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Skil Corp., Chicago, Ill.
Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Thor Power Tool Co., Aurora, Ill.

SHEARS, POWER

Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bertsch & Co., Inc., Cambridge City, Ind.
Bliss Co., E. W., Detroit, Mich.
Buckeye Tools Corp., Dayton, O.
Buffalo Forge Co., Buffalo, N. Y.
Cincinnati Shaper Co., Cincinnati, O.
Cleveland Crane & Eng. Co., Wickliffe, O.
Cleveland Punch & Shear Works Co., Cleveland, O.
Diamond Machine Tool Co., Pico, Calif.
Excelsior Tool & Machine Co., East St. Louis, Ill.
Famco Machine Co., Kenosha, Wis.
Frederick Iron & Steel Inc., Frederick, Md.
H-A Mfg. Co., York, Pa.
Heartley Machine & Tool Co., Toledo, O.
Hendley & Whittemore, Beloit, Wis.
Kling Bros. Engineering Works, Chicago, Ill.
Libert Machine Co., Green Bay, Wis.
Marshalltown Mfg. Co., Marshalltown, Ia.
Niagara Machine & Tool Wks., Buffalo, N. Y.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Peck, Stow & Wilcox Co., Southington, Conn.
Quickwork Div., Whiting Corp., Harvey, Ill.
St. Louis Tool Co., St. Louis, Mo.
Stamco Inc., New Bremen, Ohio
Verson Allsteel Press Co., Chicago, Ill.
Whiting Corp., Harvey, Ill.
Whitney Metal Tool Co., Rockford, Ill.
Wysong & Miles Inc., Greensboro, N. C.

SHEARS AND SNIPS, HAND

Barlett Mfg. Co., Detroit, Mich.
Beverly Shear Mfg. Co., Chicago, Ill.
Black & Decker Mfg. Co., Towson, Md. (electrically driven)
Bremil Mfg. Co., Erie, Pa.
Champion Blower & Forge Co., Lancaster, Pa.
Crescent Tool Co., Jamestown, N. Y.
Excelsior Tool & Machine Co., East St. Louis, Ill.
G. D. S. Machinery & Supply Co., Inc., New York, N. Y.
Henkel-Clauss Co., The, Fremont, O.
Kidder Mfg. Co., Inc., J. F. Burlington, Vt. (Angle)
Klenk's Aviation Snips, Wilmington, Del.
Niagara Machine & Tool Wks., Buffalo.
O'Neil-Irwin Mfg. Co., Lake City, Minn.
Pacific Machine & Iron Wks., Tacoma, Wash.
Peck, Stow & Wilcox Co., Southington, Conn.
Snap-on Tools Corp., Kenosha, Wis.
Thor Tool & Die Co., San Leandro, Calif.
Viking Shear Co., Erie, Pa.
Whitney Mfg. Co., W. A., Rockford, Ill.
Wielands, Incorporated, Pittsburgh, Pa. (for angles and bars)
Wiss & Sons Co., J., Newark, N. J.

SHEAVES

See Pulleys and Sheaves, for Belt Drives

SHEET METAL BRAKES

See Brakes, Sheet Metal

SHEET METAL DUCTS

See Ducts and Duct Fittings, Prefabricated

SHEET METAL FITTINGS

See Ducts and Duct Fittings, Prefabricated

SHEET METAL PUNCHES

See Punches, Sheet Metal

SHEET, ALUMINUM

Aluminum Co. of America, Pittsburgh, Pa.
American Nickeloid Co., Peru, Ill. (Nickel and chromium plated)
Central Steel & Wire Co., Chicago, Ill.
Colonial Alloys Co., Metals Div., Philadelphia, Pa.
Fairmont Aluminum Co., Fairmont, W. Va.
Kaiser Aluminum & Chemical Corp., Oakland, Calif.
Revere Copper and Brass Inc., New York.
Reynolds Metals Co., Louisville, Ky.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, ALUMINUM COATED

Armco Steel Corp., Middletown, O.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS AND BOARD, NON-METALLIC, FOR DUCT CONSTRUCTION

Atlas Mineral Products Co., Mertztown, Pa. (plastic)
Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Celotex Corp., The, Chicago, Ill.
Johns-Manville, New York, N. Y.
Keasbey Co., Robert A., New York, N. Y.
Keasbey & Mattison Co., Ambler, Pa.
Keystone Asphalt Products Co., Chicago, Ill.
Norristown Magnesia & Asbestos Co., Norristown, Pa.
Panelyte Div., St. Regis Paper Co., New York, N. Y.
Ruberoid Co., New York, N. Y.
Sall Mountain Co., Hamilton, O.
Technical Ply-Woods, Chicago, Ill.

SHEETS, CLAD

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
Aluminum Co. of America, Pittsburgh, Pa.
American Cladmetals Co., Carnegie, Pa. (Copper clad steel and stainless clad copper)
American Nickeloid Co., Peru, Ill.
Bart Mfg. Corp., Belleville, N. J.
Central Steel & Wire Co., Chicago, Ill. (aluminum)
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill.
Jessop Steel Co., Washington, Pa.
Lukens Steel Co. and Divisions, Coatsville, Pa.
Republic Steel Corp., Cleveland, O.
Revere Copper & Brass, Inc., New York.
Rigidized Metals Corp., Buffalo, N. Y.
Superior Steel Corp., Pittsburgh, Pa.
Wood Steel Co., Alan, Conshohocken, Pa.

SHEETS, COPPER

American Brass Co., Waterbury, Conn.
American Nickeloid Co., Peru, Ill. (Nickel and chromium plated)
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Hussey & Co., C. G., Div. Copper Range Co., Pittsburgh, Pa.
Inland Steel Products Co., Milwaukee, Wis.
New Haven Copper Co., The, Seymour, Conn.
Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill. (Brass, bronze, super X, phosphor bronze)
Revere Copper & Brass, Inc., New York.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, LEAD

Alpha Metals, Inc., Jersey City, N. J.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Division Lead Co., Summit, Ill.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City.
Gardiner Metal Co., Chicago, Ill.
Illinois Zinc Co., Chicago, Ill.
Lissberger & Son, Inc., Marks, Long Island City, N. Y.
National Lead Co., New York, N. Y.
Northwest Lead Co., Seattle, Wash.
Rochester Lead Wks., Rochester, N. Y.
Standard Rolling Mills, Inc., Brooklyn, N. Y.
Weirton Steel Co., Weirton, W. Va. (Alloy coated)

SHEETS, MAGNESIUM ALLOY

Dow Chemical Co., The, Midland, Mich.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, METAL, WITH PROTECTIVE NON-METALLIC COATING

American Nickeloid Co., Peru, Ill.
American Steel Band Co., Pittsburgh, Pa.
Cheney Flashing Co., Trenton, N. J.
Plasteel Products Corp., Washington, Pa.
Rigidized Metals Corp., Buffalo, N. Y.
Robertson Co., H. H., Pittsburgh, Pa.
Technical Ply-Woods, Chicago, Ill. (Metal and plywood)

SHEETS, NICKEL AND NICKEL ALLOY

American Nickeloid Co., Peru, Ill.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
International Nickel Co., Inc., The, New York, N. Y.
Lukens Steel Co. and Divisions, Coatesville, Pa.
Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill. (super x)
Revere Copper and Brass, Incorporated, New York, N. Y.
Rigidized Metals Corp., Buffalo, N. Y.

SHEETS, STEEL, COPPER BEARING

Armco Steel Corp., Middletown, O.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel & Wire Co., Chicago, Ill.
Columbia-Geneva Steel (Div. United States Steel Corp.), San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Granite City Steel Co., Granite City, Ill.
Inland Steel Co., Chicago, Ill.
Lukens Steel Co. and Divisions, Coatesville, Pa.
Newport Steel Corp., Newport, Ky.
Niles Rolling Mill Div., Sharon Steel Corp., Niles, O.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal, Iron & Railroad Co., United States Steel Corp., Subsidiary, Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

SHEETS, STEEL, GALVANIZED

Armco Steel Corp., Middletown, O.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel & Wire Co., Chicago, Ill.
Columbia-Geneva (Div. United States Steel Corp.), San Francisco, Calif.
Continental Steel Corp., Kokomo, Ind.
Inland Steel Co., Chicago, Ill.
Newport Steel Corp., Newport, Ky.
Niles Rolling Mill Div., Sharon Steel Corp., Niles, O.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal & Iron Div., United States Steel Corp., Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Weirton Steel Co., Weirton, W. Va.
Wheeling Corrugating Co., Wheeling, W. Va.
Wheeling Steel Corp., Wheeling, W. Va.
Wood Steel Co., Alan, Conshohocken, Pa.

SHEETS, STEEL, GALVANNEALED

American Agile Corp., Bedford, O. (sheets plastic)
Berger Mfg. Div., Republic Steel Corp., Canton, O.
Continental Steel Corp., Kokomo, Ind.
Columbia-Geneva Steel, (Div. United States Steel Corp.), San Francisco, Calif.
Newport Steel Corp., Newport, Ky.
Niles Rolling Mill Div., Sharon Steel Corp., Niles, O.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Sharon Steel Corp., Sharon, Pa.
United States Steel Corp., Pittsburgh, Pa.

SHEETS, STEEL, STAINLESS

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
American Nickeloid Co., Peru, Ill.
Armco Steel Corp., Middletown, O.
Berger Mfg. Div., Republic Steel Corp., Canton, O.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Duriron Co., Inc., The, Dayton, O.
Eastern Stainless Steel Corp., Baltimore, Md.
Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill.
Jessop Steel Co., Washington, Pa.
Republic Steel Corp., Cleveland, O.
Rigidized Metals Corp., Buffalo, N. Y.
Sharon Steel Corp., Sharon, Pa.
Tennessee Coal, Iron & Railroad Co., United States Steel Corp., Subsidiary, Fairfield, Ala.
United States Steel Corp., Pittsburgh, Pa.
Universal Cyclops Steel Corp., Bridgeville, Pa.
Washington Steel Corp., Washington, Pa.

SHEETS, WROUGHT IRON

Byers Co., A. M., Pittsburgh, Pa.

SHEETS, ZINC

American Nickeloid Co., Peru, Ill. (Nickel and chromium plated)
American Zinc Products Div., Ball Brothers Co., Greencastle, Ind.
Belmont Smelting & Refining Wks., Inc., Brooklyn, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Division Lead Co., Summit, Ill.
Hegeler Zinc Co., Danville, Ill.
Illinois Zinc Co., Chicago, Ill.
Matthiessen & Hegeler Zinc Co., La Salle, Ill.
New Jersey Zinc Sales Co., New York, N. Y.
Rigidized Metals Corp., Buffalo, N. Y.

SHIELDS, CORROSION, FOR PIPE JOINTS

Atlas Mineral Products Co., Mertztown, Pa.

SHIELDS, VALVE BONNET

Wilmington Plastics, Inc., Wilmington, Del.

SHOCK ABSORBERS, LIQUID

See Absorbers, Shock, Liquid

SHUTTERS

See Louvers and Shutters

SIGHT GLASSES

See Glasses, Sight, for Pipe Lines

SIGNALS, LIQUID LEVEL

See Alarms, Liquid Level

SIGNALS, TANK FILL

See Alarms, Liquid Level

SILENCERS FOR REDUCING COMPRESSOR INTAKE NOISE

Air-Maze Corp., Cleveland, O.
Dollinger Corp., Rochester, N. Y.

SLEEVE BEARINGS

See Bearings, Sleeve

SLEEVES, PIPE REPAIR

See Clamps, Pipe Repair

SLIME AND ALGAE CONTROL, WATER TREATMENT FOR

See Treatment, Water, for Slime and Algae Control

SMOKE ALARMS

See Alarms, Smoke

SMOKE ELIMINATORS

See Jets, Overfire Air, for Smoke Abatement

SMOKE GUNS

See Guns and Pots, Smoke and Smudge

SMUDGE POTS

See Guns and Pots, Smoke and Smudge

SNOW MELTING ANTI-FREEZE

See Compounds, Anti-Freeze

SOFTENERS, WATER

Alrose Chemical Co., Providence, R. I.
American Water Softener Co., Philadelphia.
American Well Works, Aurora, Ill.
Anderson-Stolz Corp., Kansas City, Mo.
Belco Industrial Equipment Div., Inc., Paterson, N. J.
Bruner Corp., Milwaukee, Wis.
Chemical Engineering Co., Dallas, Tex.
Cochrane Corp., Philadelphia, Pa.
Culligan Inc., Northbrook, Ill.
Duro Co., Dayton, O.
Elgin-Refinite, Div. of Elgin Softener Corp., Elgin, Ill.
Elgin Softener Corp., Elgin, Ill.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York.
Hungerford & Terry, Inc., Clayton, N. J.
Illinois Water Treatment Co., Rockford, Ill.
MacDermid Chemical Co., Bristol, Conn.
Myers & Bro. Co., F. E., The, Ashland, O.
Norwood Associated Engineers Inc., Springfield, Mass.
Permutit Co., New York, N. Y.
Research Products Corp., Madison, Wis.
Reynolds Shaffer Co., Detroit, Mich.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Stover Water Softener Co., St. Charles, Ill.
Uniflow Mfg. Co., Erie, Pa.
Warlo Corp., New York, N. Y.

SOLAR HEAT RESISTING LOUVERS AND SCREENS

See Louvers, Sun Reflecting; and Screens, Sun Reflecting

SOLDER (SILVER), BRAZING ALLOYS, AND FLUXES

Air-Reduction Sales Co., New York, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allen Co., Inc., L. B., Chicago, Ill.
Alpha Metals, Inc., Jersey City, N. J.
American Brass Co., Waterbury, Conn.
American Platinum Works, Newark, N. J.
Atkins Saw Div., Borg-Warner Corp., Indianapolis, Ind.
Baker & Co., Inc., Newark, N. J.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Chase Brass & Copper Co., Waterbury, Conn.
Chemalloy Associates, Santee, Calif.
Division Lead Co., Summit, Ill.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Handy & Harman, New York, N. Y.
Hardy, Inc., Charles, New York, N. Y.
Industrial Service Laboratories, Milwaukee.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
K-G Equipment Co., Allentown, Pa.
Marquette Mfg. Co., Minneapolis, Minn.
Mir-O-Col Alloy Co., Inc., Los Angeles, Calif.
Mueller Brass Co., Port Huron, Mich.
National Cylinder Gas Co., Chicago, Ill.
Oxygen Equipment & Service Co., Chicago.
Powder Weld Process Co., The, Brooklyn.
Rotometals, San Francisco, Calif.
Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., Ossining, N. Y.
Sulflo, Inc., Elizabeth, N. J.
Wabash Corp., Chicago, Ill.

SOLDER (TIN-LEAD), AND FLUXES

Allen Co., Inc., L. B., Chicago, Ill.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Alpha Metals, Inc., Jersey City, N. J.
American Brass Co., Waterbury, Conn.
American Solder & Flux Co., Philadelphia, Pa.
Belmont Smelting & Refining Works, Inc., Brooklyn, N. Y.
Benson Co., Inc., Alex R., Hudson, N. Y.
Burnley Battery & Mfg. Co., North East, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Chemalloy Associates, Santee, Calif.
Division Lead Co., Summit, Ill.
du Pont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington, Del.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Federated Metals Div., American Smelting & Refining Co., New York, N. Y.
Flemm Lead Co., Inc., Long Island City, N. Y.
Fluxolder Co., Detroit, Mich. (solder paints)
Galv-Weld Products, Lima, O.
Gardiner Metal Co., Chicago, Ill.
Glaser Lead Co., Inc., Brooklyn, N. Y.
Hercules Chemical Co., Inc., New York, N. Y.
Industrial Service Laboratories, Milwaukee, Wis.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Johnson Foil Mfg. Co., The, St. Louis, Mo.
Kester Solder Co., Chicago, Ill.
Klauer Mfg. Co., Dubuque, Ia.
Lake Chemical Co., Chicago, Ill.
Lenk Mfg. Co., Boston, Mass.
Lissberger & Son, Inc., Marks, Long Island City, N. Y.
London Chemical Co., Chicago, Ill.
Merchant & Evans Co., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
National Lead Co., New York, N. Y.
Northwest Lead Co., Seattle, Wash.
Paul-Lewis Laboratories, Inc., Milwaukee, Wis.
Potts-Farrington Co., Philadelphia, Pa.
Powder Weld Process Co., The, Brooklyn, N. Y.
Rochester Lead Works, Inc., Rochester, N. Y.
Rotometals, San Francisco, Calif.
Ruby Chemical Co., Columbus, O.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Soldering Specialties Co., Summit, N. J.
Special Chemicals Corp., Ossining, N. Y.
Standard Rolling Mills, Inc., Brooklyn, N. Y.
Sulflo, Inc., Elizabeth, N. J.
Utility Laboratory, Inc., Brooklyn, N. Y.
Wolfe-Kote Co., Inc., Sheboygan, Wis.

SOLENOIDS AND SOLENOID COILS

A-P Controls Corp., Milwaukee, Wis.
Allen-Bradley Co., Milwaukee, Wis.
Automatic Switch Co., Orange, N. J.
Birdsell Mfg. Co., Inc., Palo Alto, Calif.
Cook Electric Co., Chicago, Ill.
Cooper Co., Clark, Palmyra, N. J.
Cutler-Hammer, Inc., Milwaukee, Wis.
Dormeyer Industries, Chicago, Ill.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
Hubbell Corp., Mundelein, Ill.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
Jefferson Electric Co., Bellwood, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
McQuay-Norris Mfg. Co., St. Louis, Mo.
National Acme Co., The, Cleveland, O.
Soreng Products Corp., Schiller Park, Ill.
Struthers-Dunn, Inc., Pitman, N. J.
Synchro-Start Products, Inc., Skokie, Ill.
Trombetta Solenoid Corp., Milwaukee, Wis.

SOLENOID VALVES

See Valves, Solenoid

SOLVENT, PENETRANT, FOR LOOSENING THREADED JOINTS

Permatex Co., Inc., Brooklyn, N. Y.
Petroleum Solvents Corp., New York, N. Y.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sealed Unit Parts Co., Inc., Bronx, N. Y.

SOOT BLOWERS

See Blowers, Soot

SOOT DESTROYERS

See Destroyers, Soot, Chemical

SOUND CONTROL FOR COOLING TOWERS

See Noise Elimination for Cooling Towers

SOUND INDICATORS

See Indicators, Sound Level

SOUND TESTERS FOR LOCATING MECHANICAL TROUBLES

See Testers, Sound

SPARGER NOZZLES

See Nozzles, Sparger, for Tank Heating

SPEED CHANGERS

See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical

SPEED REDUCERS

See Reducers, Speed

SPIRAL PIPE

See Pipe, Spiral, Riveted and Welded

SPOT WELDERS

See Welders, Spot

SPRAY HUMIDIFIERS

See Humidifiers, Direct, Spray Head

SPRAY NOZZLES

See Nozzles, Spray

SPRAY PAINTING BOOTHS

See Booths, Painting, Spray

SPRINKLER HEADS

See Heads, Sprinkler

SPRINKLER SYSTEM CONTROLS

See Controls, Fire Protection Sprinkler System; Valves, Fire Protection Sprinkler System Control

SPRINKLERS FOR FIRE PROTECTION

See Heads, Sprinkler

STACKS AND CHIMNEYS, INDUSTRIAL, PREFABRICATED

Bigelow Co., The, New Haven, Conn.
Chicago Metal Mfg. Co., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Hodge Boiler Wks., East Boston, Mass.
Kellogg Co., M. W., The, New York, N. Y.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Prat-Daniel Corp., South Norwalk, Conn.
Van-Packer Corp., Bettendorf, Ia.

STAINLESS STEEL PIPE

See Pipe, Steel, Stainless

STAINLESS STEEL SHEETS

See Sheets, Steel, Stainless

STANDS, PIPE VISE

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Capewell Mfg. Co., Hartford, Conn.
International Forge Co., Chicago, Ill.
Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Martin & Sons, H. P., Owensboro, Ky.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Cleveland, O.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Talon Tools, Inc., North Arlington, N. J.
Western Wire Products Co., St. Louis, Mo.
Williams & Co., J. H., Buffalo, N. Y

STAPLES FOR FASTENING TUBING

See Hangers and Supports, Pipe

STARTERS, MOTOR

See Controllers and Starters, Motor

STEAM BOOSTER COMPRESSORS

See Compressors, Steam Booster

STEAM ENGINES

See Engines, Steam

STEAM GENERATORS

See Boilers

STEAM JET HEATERS

See Heaters, Steam Jet, for Liquids

STEAM JET REFRIGERATION

See Compressors, Refrigerating, Steam Jet

STEAM PRESSURE REGULATORS

See Valves, Pressure Reducing and Regulating

STEAM PUMPS

See Pumps, Steam

STEAM SEPARATORS

See Separators, Steam and Oil

STEAM TRAPS

See Traps, Steam

STEEL PIPE

See Pipe, Steel

STEEL TUBE FITTINGS, FLARED

See Fittings, Steel Tube, Flared

STEEL TUBING

See Tubing, Steel

STEEL UNIONS

See Unions, Steel

STEEL VALVES

See Valves, Gate; and Valves, Globe

STERILIZING LAMPS

See Lamps, Sterilizing, for Duct Installation

STERILIZING UNITS

See Units, Sterilizing, Air

STOCKS AND DIES

American Pipe Tool Co., Chicago, Ill.
Armstrong Mfg. Co., Bridgeport, Conn.
Beaver Pipe Tools, Inc., Warren, O.
Capewell Mfg. Co., Hartford, Conn.
Champion Blower & Forge Co., Lancaster, Pa.
Crown Die & Tool Corp., Chicago, Ill. (Pipe)
Greenfield Tap & Die Corp., Greenfield, Mass.
Hollands Mfg. Co., Erie, Pa.
Nye Tool Co., Chicago, Ill.
Oster Mfg. Co., Cleveland, O.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Saunders Mfg. Co., Yonkers, N. Y.
Threadwell Tap & Die Co., Greenfield, Mass.
Toledo Pipe Threading Machine Co., Toledo, O.

STOKERS, INDUSTRIAL AND COMMERCIAL

61 to 1200 Lb per Hr

Allington & Curtis Mfg. Co., Saginaw, Mich. (For shavings, chips and sawdust)
American Coal Burner and Wood Stoker Corp., Chicago, Ill.
American Engineering Co., Philadelphia, Pa.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Auburn Burner Co., Auburn, Ind.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Automatic Firing Corp., St. Louis, Mo.
Babcock & Wilcox Co., New York, N. Y.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Canton Stoker Corp., Canton, O.
Carnes, Inc., John R., Lima, O.
Carpenter Heating & Stoker Co., Cleveland, O.
Central Rubber & Steel Corp., Findlay, O.
Combustion Engineering, Inc., New York, N. Y.
Detroit Stoker Co., Detroit, Mich.
Econocol Stoker Div. of Cotta Transmission Co., Rockford, Ill.
Eddy Stoker Corp., Chicago, Ill.
Electric Furnace-Man, Inc., Emmaus, Pa.
Erie City Iron Works, Erie, Pa.
Fire-King Stoker Co., Indianapolis, Ind.
Flynn & Emrich Co., Baltimore, Md.
Frederick Iron & Steel Inc., Frederick, Md.
Freeman Stoker Div., Illinois Iron & Bolt Co., Chicago, Ill.
Fuel Savers, Inc., Harrisburg, Pa.
General Machinery Co., Spokane, Wash.
Gross-Aire Mfg. Co., Overland, Mo.
Gunnite Foundries Corp., Rockford, Ill. (Screws)
Heating Assurance, Inc., Spokane, Wash.
Her-Born Engrg. & Mfg. Co., Sandusky, O.
Hershey Machine & Foundry Co., Motorstokor Div., Manheim, Pa. (anthracite)
Hoffman Combustion Engrg. Co., Detroit, Mich. (spreader type)
Iron Fireman Mfg. Co., Cleveland, O.
Johnston & Jennings Co., Cleveland, O.
Kingston Products Corp., Kokomo, Ind.
Kol-Master Corp., Oregon, Ill.
Laclede Stoker Co., St. Louis, Mo. (chain grate, spreader)
Leffel & Co., James, Springfield, O.
Loyal Knight Stokers, Inc., Belleville, Ill.
Mallory Sales Co., Dolton, Ill.
Meyer Furnace Co., The, Peoria, Ill.
Muncie Gear Wks., Inc., Muncie, Ind.
National Steam Pump Co., Upper Sandusky, O.
Newcomb-Detroit Co., Detroit, Mich.
Ormsby-Osterman, Inc., St. Louis, Mo.
Perfection Grate & Stoker Co., Springfield, Mass.
Rheem Mfg. Co., New York, N. Y.
Riley Stoker Corp., Worcester, Mass.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Steel Products Engineering Co., Springfield, O.
Stewart-Warner Corp., U.S. Machine Div., Lebanon, Ind.
Sun-Fire Stoker Corp., New Albany, Ind. (Hopper and bin feed)
V. & E. Products, Inc., Schuylkill Haven, Pa.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whiting Fire Power Products Corp., Superior, Wis.
Whitty Co., Inc., Boston, Mass. (Bituminous)
Will-Burt Co., The, Orrville, O.

STONEWARE PIPE

See Pipe, Stoneware

STORAGE WATER HEATERS

See Heaters, Water, Steam, Storage

STRAINERS, PIPE LINE

A-P Controls Corp., Milwaukee, Wis.
Air Maze Corp., Cleveland, O.
Alco Valve Co., St. Louis, Mo.
American District Steam Co., Inc., North Tonawanda, N. Y.
Andale Co., Philadelphia, Pa.
Anderson Co., V. D., The, Cleveland, O.
Armstrong Machine Wks., Three Rivers, Mich.
Automatic Switch Co., Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barnes & Jones, Inc., Boston, Mass. (steam and water only)
Barrett, Haentjens & Co., Hazleton, Pa.
Blackmer Pump Co., Grand Rapids, Mich.
Bowser, Inc., Fort Wayne, Ind.
Boylston Steam Specialty Co., Chicago, Ill.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cashin Co., W. D., Boston, Mass.
Clark Mfg. Co., Cleveland, O.
Coen Co., San Francisco, Calif.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Cuno Engineering Corp., Meriden, Conn.
Davis Regulator Co., Chicago, Ill.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
De Zurik Shower Co., Sartell, Minn.
Eddington Metal Specialty Co., Eddington, Pa.
Edward Valves, Inc., East Chicago, Ind.
Elliott Co., Jeannette, Pa.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Newark, N. J.
Foster Pump Works, Inc., Union, N. Y.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (ceramic)
General Controls Co., Glendale, Calif. and Skokie, Ill.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Hauck Mfg. Co., Brooklyn, N. Y.
Hays Mfg. Co., Erie, Pa.
Henry Valve Co., Melrose Park, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Keckley Co., O. C., Chicago, Ill.

Kenmore Machine Products, Inc., Lyons, N. Y.
Kieley & Mueller, Inc., Middletown, N. Y.
Kinney Mfg. Div., The New York Air Brake Co., Boston, Mass.
Kraissl Co., Inc., The, Hackensack, N. J.
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y.
Leslie Co., Lyndhurst, N. J.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Monarch Mfg. Wks., Inc., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Long Island City, N. Y.
Newark Wire Cloth Co., Newark, N. J.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
OPW Corp., Cincinnati, O.
Phillips & Co., H. A., Chicago, Ill.
Perfecting Service Co., Charlotte, N. C.
Preferred Utilities Mfg. Corp., New York, N. Y.
Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Roylon, Inc., Glendale, Calif.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Self Cleaning Strainer Co., Chicago, Ill.
Sheffler-Gross Co., Philadelphia, Pa.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Standard Machine & Mfg. Co., St. Louis, Mo.
Staples & Pfeiffer, San Francisco, Calif.
Sterling, Inc., Milwaukee, Wis.
Strong, Carlisle & Hammond Co., Cleveland, O.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Trimount Rotary Power Co., Dedham, Mass.
Tryco Products, Inc. Westfield, Mass.
Walworth Co., New York, N. Y.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
Winslow Engineering Co., Oakland, Calif.
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.
Zurn Mfg. Co., J. A., Industrial Div., Erie, Pa.

STRAINERS, REFRIGERANT, LIQUID LINE

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
General Controls Co., Glendale, Calif.
Henry Valve Co., Melrose Park, Ill.
Hubbell Corp., Mundelein, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Madden Brass Products Co., Aurora, Ill.
Newark Wire Cloth Co., Newark, N. J.
Penn Controls, Inc., Goshen, Ind.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Self Cleaning Strainer Co., Chicago, Ill.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve & Fittings Co., Pittsburgh, Pa.

STRAINERS, SUCTION, FOR AIR WASHERS

Bahnson Co., Winston-Salem, N. C.
Eddington Metal Specialty Co., Eddington, Pa.
Keckley Co., O. C., Chicago, Ill.
Newark Wire Cloth Co., Newark, N. J.

STRESS RELIEVERS

See Preheaters and Stress Relievers, Electric, for Pipe Welds

STRIP HEATERS

See Heaters, Strip and Immersion, Electric

STRUCTURAL SHAPES

See Angles, Bars, Beams, Channels and Tees

STUD DRIVERS

See Fasteners, Powder Operated

STUD WELDERS

See Welders, Stud

SUCTION LINE HEAT EXCHANGERS

See Exchangers, Heat, Refrigerant Suction Line

SUMP PUMPS

See Pumps, Sump

SUPERHEATERS, PROCESS STEAM

Alstrom Corp., New York, N. Y.
Babcock & Wilcox Co., New York, N. Y.
Bell & Gossett Co., Morton Grove, Ill.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Combustion Engineering, Inc., New York, N. Y.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Edge Moor Iron Works, Inc., Edge Moor, Del.
Ewing Mfg. Co., Oklahoma City, Okla.
Foster Wheeler Corp., New York, N. Y.
General Heaters & Regulators Co., East Chicago, Ind.
Selas Corp. of America, Philadelphia, Pa.
Springfield Boiler Co., Springfield, Ill.
Union Iron Works, Erie, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

SURFACE, FINNED, COOLING, BRINE

Aerofin Corp., Syracuse, N. Y.
American Blower Corp., Detroit, Mich.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Conditionaire Unit Co., Chicago, Ill.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Doyle & Roth Mfg. Co, Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Los Angeles, Calif.
G. & O. Mfg. Co., New Haven, Conn.
Griscom-Russell Co., The, Massillon, O.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Murray Mfg. Co., D. J., Wausau, Wis.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products, Inc., Minneapolis, Minn.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Vilter Mfg. Co., Milwaukee, Wis.
Wolverine Tube Div. of Calumet and Hecla, Inc., Detroit, Mich.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, COOLING, COLD WATER

Aerofin Corp., Syracuse, N. Y.
American Blower Corp., Detroit, Mich.
American Coils Co., Newark, N. J.
Bayley Blower Co., Milwaukee, Wis.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Conditionaire Unit Co., Chicago, Ill.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Los Angeles, Calif.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Hastings Air Conditioning Co., Hastings, Neb.
Heatron, Inc., York, Pa.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Pleasantaire Corp., Washington, D. C.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products, Inc., Minneapolis, Minn.
Super-Cold Corp., Los Angeles, Calif.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.
Wolverine Tube Div. of Calumet & Hecla, Inc., Detroit, Mich.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, COOLING, DIRECT EXPANSION

Aerofin Corp., Syracuse, N. Y.
American Blower Corp., Detroit, Mich.
American Coils Co., Newark, N. J.
Bayley Blower Co., Milwaukee, Wis.
Betz Corp., Hammond, Ind.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Conditionaire Unit Co., Chicago, Ill.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Los Angeles, Calif.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Hastings Air Conditioning Co., Hastings, Neb.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kennard Corp., St. Louis, Mo.
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Merchant & Evans Co., Philadelphia, Pa.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.

Niagara Blower Co., New York, N. Y.
Peerless of America, Inc., Chicago, Ill.
Perfex Corp., Milwaukee, Wis.
Pleasantaire Corp., Washington, D. C.
Refrigeration Appliances Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products, Inc., Minneapolis, Minn.
Super-Cold Corp., Los Angeles, Calif.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wolverine Tube Div. of Calumet & Hecla, Inc., Detroit, Mich.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE, FINNED, HEATING AND COOLING, PRE-ASSEMBLED, INCLUDING COILS, ELIMINATOR PLATES, SETTLING TANK, AND CASING

Clarage Fan Co., Kalamazoo, Mich.
Refrigeration Appliances, Inc., Chicago, Ill.
Rome-Turney Radiator Co., Rome, N. Y.

SURFACE, FINNED, HEATING, INDIRECT, FERROUS

Bayley Blower Co., Milwaukee, Wis.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Conditionaire Unit Co., Chicago, Ill.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Los Angeles, Calif.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.
G & O Mfg. Co., New Haven, Conn.
Griscom-Russell Co., The, Massillon, O.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
National Radiator Co., The, Johnstown, Pa.
New York Blower Co., Chicago, Ill.
Niagara Blower Co., New York, N. Y.
Refrigeration Economics Co., Inc., Canton, O.
Rigidbilt Inc., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products Inc., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

SURFACE, FINNED, HEATING, INDIRECT, NON-FERROUS

Aerofin Corp., Syracuse, N. Y.
American Blower Corp., Detroit, Mich.
American Coils Co., Newark, N. J.
Bayley Blower Co., Milwaukee, Wis.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Drayer-Hanson, Inc., Los Angeles, Calif.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
G & O Mfg. Co., New Haven, Conn.
Governair Corp., Oklahoma City, Okla.
Griscom-Russell Co., The, Massillon, O.
Hastings Air Conditioning Co., Hastings, Neb.
Heat-X, Inc., Brewster, N. Y.
Hoff Mfg. Co., Bethany, New Haven, Conn.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Marlo Coil Co., St. Louis, Mo.
McCord Corp., Detroit, Mich.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Murray Mfg. Co., D. J., Wausau, Wis.
Nesbitt, Inc., John J., Philadelphia, Pa.
Niagara Blower Co., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rittling Corp., The, Buffalo, N. Y.
Rome-Turney Radiator Co., Rome, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Silco Products Inc., Minneapolis, Minn.
Super-Cold Corp., Los Angeles, Calif.
Super Radiator Corp., Minneapolis, Minn.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Vulcan Radiator Co., Hartford, Conn.
Webster & Co., Warren, Camden, N. J.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Wing Mfg. Co., L. J., Linden, N. J.
Wolverine Tube Div. of Calumet & Hecla, Inc., Detroit, Mich.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

SURFACE THERMOSTATS

See Thermostats, Surface

SUSPENDED FURNACES

See Heaters, Air

SWING JOINTS

See Joints, Pipe, Flexible Swing and Revolving

SWITCHES, ELECTRICAL

Acro Mfg. Co., The, Columbus, O.
Adam Electric Co., Frank, St. Louis, Mo.
Aerotec Corp., The, Greenwich, Conn.
Allen-Bradley Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Automatic Switch Co., Orange, N. J.
Barber-Colman Co., Rockford, Ill.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Clark Controller Co., Cleveland, O.
Congress Fan & Electric Co., Daytona Beach, Fla.
Cooper Co., Clark, Palmyra, N. J.
Crise Mfg. Co., The, Columbus, O.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., St. Louis, Mo.
Ebert Electronics Corp., Queens Village, N. Y.
Electric Controller & Mfg Co., Cleveland, O.
Electro-Switch & Controls, Inc., Culver City, Calif.
Essex Wire Corp., Ft. Wayne, Ind.
Ferro Electric Products, Inc., Kirkland, Ill.
Furnas Electric Co., Batavia, Ill.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Guardian Electric Mfg. Co., Chicago, Ill.
Hart Mfg. Co., Hartford, Conn.
Kulka Electric Mfg. Co., Mt. Vernon, N. Y.
Line Material Co., Milwaukee, Wis.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
MicroSwitch Div. of Minneapolis-Honeywell Regulator Co., Freeport, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Monitor Controller Co., The, Boston, Mass.
Morse-Smith-Morse, Inc., Watertown, Mass.
Multi-Vent Div., Pyle-National Co., Chicago, Ill.
National Acme Co., The, Cleveland, O.
Penn Controls, Inc., Goshen, Ind.
Pyle-National Co., The, Chicago, Ill.
Square D Co., Detroit, Mich.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Struthers-Dunn, Inc., Pitman, N. J.
Tork Clock Co., Inc., Mount Vernon, N. Y.
Trumbull Components Dept., General Electric Co., Plainville, Conn.
Unimax Switch Div., W. L. Maxson Corp., New York, N. Y.
United Electric Controls Co., Watertown, Mass.
Ward Leonard Electric Co., Mount Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.
Wind-Way Fan & Ventilator Co., New Orleans, La. (fire fuse)
Zenith Electric Co., Chicago, Ill.

SWITCHES, FLOAT, REFRIGERATION

Alco Valve Co., St. Louis, Mo.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Clark Controller Co., Cleveland, O.
Frick Co., Waynesboro, Pa.
Magnetrol, Inc., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., The, Chicago, Ill.
Soreng Products Corp., Schiller Park, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.

SWITCHES, FLOW

Cook Electric Co., Chicago, Ill.
Cooper Co., Clark, Palmyra, N. J.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Drying Systems, Inc., Chicago, Ill. (air)
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hays Mfg. Co., Erie, Pa.
Magnetrol, Inc. Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.

SWITCHES, LIQUID LEVEL

Acro Mfg. Co., The, Columbus, O.
Alco Valve Co., St. Louis, Mo.
Allen-Bradley Co., Milwaukee, Wis.
Arrow-Hart & Hegeman Elect. Co., Hartford, Conn.
Automatic Control Co., St. Paul, Minn.
Bennett Oil Co., Omaha, Neb.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Clark Controller Co., Cleveland, O.
Cook Electric Co., Chicago, Ill.
Cooper Co., Clark, Palmyra, N. J.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N.Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., St. Louis, Mo.
Detroit Controls Corp., Detroit, Mich.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Furnas Electric Co., Batavia, Ill.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hays Mfg. Co., Erie, Pa.
Healy Ruff Co., St. Paul, Minn.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Kenco Pump Co., Lorain, O.
Kisco Boiler & Engineering Co., St. Louis, Mo.
Magnetrol Inc., Chicago, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monitor Controller Co., The, Boston, Mass.
Newark Controls Co., Bloomfield, N. J.
Penn Controls, Inc., Goshen, Ind.

Photoswitch, Inc., Cambridge, Mass.
Ripley Co., Inc., Middletown, Conn.
Schaub Engineering Co., Fred H., Chicago, Ill.
Soreng Products Corp., Schiller Park, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Stephens-Adamson Mfg. Co., Aurora, Ill.
United Electric Controls Co., Watertown, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.

SWITCHES, MERCURY

Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Durakool, Inc., Elkhart, Ind.
Ebert Electronics Corp., Queens Village, N. Y.
G. M. Mfg. Co., New York, N. Y.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Mercoid Corp., Chicago, Ill.
MicroSwitch Div. of Minneapolis-Honeywell Reg. Co., Freeport, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Newark Controls Co., Bloomfield, N. J.
Westinghouse Electric Corp., Pittsburgh, Pa.

SWITCHES, PNEUMATIC

Automatic Control Co., St. Paul, Minn.
Bristol Co., The, Waterbury, Conn.
Cook Electric Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
United Electric Controls Co., Watertown, Mass.

SWITCHES, PRESSURE AND VACUUM

Aerotec Corp., The, Greenwich, Conn.
Allen-Bradley Co., Milwaukee, Wis.
Au-Temp-Co Corp., New York, N. Y.
Automatic Control Co., St. Paul, Minn.
Barksdale Valves, Los Angeles, Calif.
Bristol Co., The, Waterbury, Conn.
Clark Controller Co., Cleveland, O.
Cook Electric Co., Chicago, Ill.
Cooper Co., Clark, Palmyra, N. J.
Coral Designs Div. of Henry G. Dietz Co., Long Island City, N. Y.
Cutler-Hammer, Inc., Milwaukee, Wis.
Defender Instrument & Regulator Co., St. Louis, Mo.
Detroit Controls Corp., Detroit, Mich.
Dwyer Mfg. Co., F. W., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Furnas Electric Co., Batavia, Ill.
General Controls Corp., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Giannini & Co., Inc., G. M., Pasadena, Calif.
H-B Instrument Co., Philadelphia, Pa.
Healy Ruff Co., St. Paul, Minn.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Leach Relay Co., Los Angeles, Calif.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monitor Controller Co., The, Boston, Mass.
Newark Controls Co., Bloomfield, N. J.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Shallcross Controls, Inc., Milwaukee, Wis.
Soreng Products Corp., Schiller Park, Ill.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Synchro-Start Products, Inc., Skokie, Ill.
United Electric Controls Co., Watertown, Mass.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.

SWITCHES, TIME

A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N. J.
Allen-Bradley Co., Milwaukee, Wis.
April Showers Co., Inc., Washington, D. C.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Automatic Electric Mfg. Co., Mankato, Minn.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Bristol Co., The, Waterbury, Conn.
Cooper Co., Clark, Palmyra, N. J.
Cramer Co., R. W., Centerbrook, Conn.
Durakool, Inc., Elkhart, Ind.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
General Controls Corp., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hansen Mfg. Co., Princeton, Ind. (timing motors and time machine)
Haydon Mfg. Co., Inc., Sub. General Time Instruments Corp., Torrington, Conn.
Heat Timer Corp., New York, N. Y.
Industrial Engineering Corp., Terre Haute, Ind.
International Business Machines Corp., New York, N. Y.
International Register Co., Chicago, Ill.
Landis & Gyr, Inc., New York, N. Y.
Mercoid Corp., Chicago, Ill.
Miller-Harris Instrument Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
National Time & Signal Corp., Detroit, Mich.
Paragon Electric Co., Two Rivers, Wis.
Perfex Corp., Milwaukee, Wis.
Photoswitch, Inc., Cambridge, Mass.
Precision Products, Inc., Tulsa, Okla.
Reliance Automatic Lighting Co., Racine, Wis.
Reynolds Electric Co., River Grove, Ill.
Rhodes, Inc., M. H., Hartford, Conn.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Sangamo Electric Co., Springfield, Ill.
Soreng Products Corp., Schiller Park, Ill.
Telechron Dept. General Electric Co., Ashland, Mass.
Time 'Trol Co., Great Neck, L. I., N. Y.
Tork Clock Co., Inc., Mount Vernon, N. Y.
Ward Leonard Electric Co., Mount Vernon, N. Y.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.
Zenith Electric Co., Chicago, Ill.

SWIVEL PIPE COUPLINGS

See Joints, Pipe, Flexible Swing and Revolving

SYSTEMS, COMBUSTION CONTROL

Ace Instrument Co., Inc., Brooklyn, N. Y.
Askania Regulator Co., Chicago, Ill.
Aurora Pump Co., Aurora, Ill.
Bailey Meter Co., Cleveland, O.
Barber-Colman Co., Rockford, Ill.
Bowser, Inc., Fort Wayne, Ind.
Bressler Engineering Service, Oregon, Ill.
Bristol Co., Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Canton Stoker Corp., Canton, O.
Cash Co., A. W., Decatur, Ill.
Cleveland Fuel Equipment Co., Cleveland, O.
Combustion Control Div., Electronics Corp. of America, Boston, Mass.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Defender Instrument & Regulator Co., St. Louis, Mo.
De-Tec-Tronic Laboratories, Inc., Chicago, Ill.
Engineer Co., New York, N. Y.
Ess Instrument Co., Bergenfield, N. J.
Fischer & Porter Co., Hatboro, Pa.
General Electric Co., Apparatus Dept., Schenectady, N. Y.
Hagan Corp., Pittsburgh, Pa.
Hays Corp., Michigan City, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Leahy Mfg. Co., Los Angeles, Calif.
Lientz Co., B. P., Kansas City, Mo.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Republic Flow Meters Co., Chicago, Ill.
Selas Corp. of America, Philadelphia, Pa.
Shallcross Controls, Inc., Milwaukee, Wis.
Standard Instrument Corp., New York, N. Y.
Stout & Sons, David, St. Louis, Mo.
Webster Engineering Co., Tulsa, Okla.
Wing Mfg. Co., L. J., Linden, N. J

SYSTEMS, CONDENSATE RETURN

Acker Organizations, Inc., W. M., Meridian, Miss.
Advance Pump Co., Berkeley, Calif.
Aurora Pump Co., Aurora, Ill.
Barnes & Jones, Inc., Boston, Mass.
Cissell Mfg. Co., Inc., W. M., Louisville, Ky.
Dunham Co., C. A., Chicago, Ill.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Flight Mfg. Corp., Camden, N. J.
Goulds Pumps, Inc., Seneca Falls, N. Y.
Jacuzzi Bros., Inc., Richmond, Calif.
Johnson Corp., The, Three Rivers, Mich.
Lattner Mfg. Co., P. M., Cedar Rapids, Iowa
Orr & Sembower, Inc., Reading, Pa.
Roth Co., Roy E., Rock Island, Ill.
Sacro Co., Inc., New York, N. Y.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Stout & Sons, David, St. Louis, Mo.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Templeton Bros., Hyde Park, Mass.
York-Shipley, Inc., York, Pa.

SYSTEMS, ELECTRIC PIPE HEATING

Fluid Systems, Inc., New Haven, Conn.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Industrial Engineering & Equipment Co., St. Louis, Mo.
Trent, Inc., Philadelphia, Pa.
Wiegand Co., Edwin L., Pittsburgh, Pa.

SYSTEMS, FIRE EXTINGUISHING, AND HEAT AND SMOKE DETECTORS

Allen Mfg. Co., W. D., Chicago, Ill.
Blaw Knox Co, Power Piping & Sprinkler Div., Pittsburgh, Pa.
C-O-Two Fire Equipment Co., Newark, N. J.
Cardox Corp., Chicago, Ill.
Edison, Inc., Thomas A., West Orange, N. J.
Grinnell Co., Inc., Providence, R. I.
Merchant & Evans Co., Philadelphia, Pa.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
Rockwood Sprinkler Co., Worcester, Mass.

SYSTEMS, HEATING, HIGH TEMPERATURE HOT WATER

Over 350 F

American Hydrotherm Corp., Long Island City, N. Y.
International Boiler Works, The, East Stroudsburg, Pa.
Ross Engineering Corp., J. O., New York.

SYSTEMS, HEATING, HOT WATER

Baseline Mfg. Co., Minneapolis, Minn.
Bell & Gossett Co., Morton Grove, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.
General Heaters & Regulators Co., East Chicago, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hook & Ackerman, Inc., New York, N. Y.
Kainer & Co., Chicago, Ill.
Kehm Corp., The, Chicago, Ill.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Preferred Utilities Mfg. Corp., New York, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.

Sullivan Valve & Engineering Co., Butte, Mont.
Taco Heaters, Inc., Providence, R. I.
Thrush & Co., H. A. Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.

SYSTEMS, HEATING, VACUUM

Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

SYSTEMS, HEATING, VAPOR

Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham Co., C. A., Chicago, Ill.
Fedders-Quigan Corp., Trenton Div., Trenton, N. J.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Radiator Valve Co. of America, Philadelphia, Pa.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Webster & Co., Warren, Camden, N. J.

SYSTEMS, HEATING, ZONE CONTROL

Acro Mfg. Co., The, Columbus, O.
Armstrong Machine Wks., Three Rivers, Mich.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Barnes & Jones, Inc., Boston, Mass.
Bell & Gossett Co., Morton Grove, Ill.
Dravo Corp., Machinery Div., Pittsburgh, Pa.
Dunham Co., C. A., Chicago, Ill.
General Heaters & Regulators Co., East Chicago, Ind.
Heat Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
SelecTemp Div., Iron Fireman Mfg. Co., Cleveland, O.
Simplex Heating Specialty Co., Inc., Lynchburg, Va.
Sullivan Valve & Engineering Co., Butte, Mont.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Thrush & Co., H. A., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Zone-Heat Regulator Co., Garrettsville, O.

SYSTEMS, HOT GAS DEFROSTING, FOR REFRIGERATION

Bush Mfg. Co., West Hartford, Conn.
Dole Refrigerating Co., Chicago, Ill.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
McQuay, Inc., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Refrigeration Appliances, Inc., Chicago, Ill.
Tenney Engineering, Inc., Union, N. J.
Vilter Mfg. Co., The, Milwaukee, Wis.

SYSTEMS, PROCESS HEATING, HIGH TEMPERATURE

American Hydrotherm Corp., Long Island City, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Dow Chemical Co., The, Midland, Mich.
Dravo Corp., Pittsburgh, Pa.
Drying Systems, Inc., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Hynes Electric Heating Div., Turbine Equipment Co., Westfield, N. J.
Illinois Engineering Co, Div. of American Air Filter Co., Inc., Chicago, Ill.
International Boiler Works, The, East Stroudsburg, Pa.
Mitchell & Co., Inc., W. K., Philadelphia, Pa.
Olson & Co., Arthur A., Canfield, O.
Parks-Cramer Co., Fitchburg, Mass.
Peabody Engineering Corp., New York, N. Y.
Ross Engineering Corp., J. O., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Selas Corp. of America, Philadelphia, Pa.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Struthers Wells Corp., Titusville, Pa.
Trent, Inc., Philadelphia, Pa.
Wing Mfg. Co., L. J., Linden, N. J.

SYSTEMS, ROOF SPRAYING (FOR COOLING ROOFS)

April Showers Co, Inc., Washington, D. C.
Binks Mfg. Co., Chicago, Ill.
Ross Sprinkler Co., Rosemead, Calif.
Ruppright's Rotary Roof Cooler, Los Angeles, Calif.
Skinner Irrigation Co., Troy, O.
Spray Engineering Co., Somerville, Mass.
Spraying Systems Co., Bellwood, Ill.
Water Cooling Corp., New York, N. Y.

TABLES, BENDING, PIPE

American Pipe Bending Machine Co., Inc., Poultney, Vt.

TAGS, VALVE, FOR IDENTIFYING VALVES

Chase Brass & Copper Co., Waterbury, Conn.
Meyer & Wenthe, Inc., Chicago, Ill.
Seton Name Plate Co., New Haven, Conn.

TANK FITTINGS

See Fittings and Bushings, Fuel Oil Tank; Alarms, Liquid Level

TANK HEADS

See Parts, for Heating and Air Conditioning Equipment

TANK LININGS

See Coatings, Protective, for Metals

TANKS, BLOWOFF

American District Steam Co., Inc., North Tonawanda, N. Y.
Bigelow Co., The, New Haven, Conn.
Buffalo Tank Corp., Dunellen, N. J.
Bros Boiler & Mfg Co., Wm., Minneapolis, Minn.
Chicago Steel Tank Co., Chicago, Ill.
Downingtown Iron Works, Downingtown, Pa.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Hoppes Mfg. Co., Inc., Springfield, O.
International Boiler Works Co., The, East Stroudsburg, Pa.
Koven & Bro., L. O., Inc., Jersey City, N J.
Lucey Boiler & Mfg. Corp., Chattanooga, Ill.
Manitowoc Shipbuilding, Inc, Manitowoc, Wis.
Morrison Brothers Co., Dubuque, Ia.
Murray Iron Wks. Co., Burlington, Ia.
Nooter Corp., St. Louis, Mo.
Norse Boiler Co., Inc, New Market, N. J.
Quaker City Iron Wks., Philadelphia, Pa.
Richmond Engineering Co., Inc., Richmond, Va.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Union Iron Works, Erie, Pa.
Wright-Austin Co., Detroit, Mich.

TANKS, EXPANSION, FOR HOT WATER HEATING SYSTEMS

American District Steam Co., Inc., North Tonawanda, N. Y.
Baseline Mfg. Co., Minneapolis, Minn.
Bell & Gossett Co., Morton Grove, Ill.
Biggs Boiler Works Co., E. Akron, O.
Birchfield Boiler, Inc., Tacoma, Wash.
Buffalo Tank Corp., Dunellen, N. J.
Caldwell Co., W. E., Louisville, Ky.
Case & Son Mfg. Co., W. A., Buffalo, N. Y.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
General Heaters & Regulators Co., East Chicago, Ind.
Kehm Corp., The, Chicago, Ill.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Maysteel Products, Inc., Milwaukee, Wis.
Morrison Brothers Co., Dubuque, Ia.
National Steel Construction Co., Logansport, Ind.
Norse Boiler Co., Inc., New Market, N. J.
Quaker City Iron Wks., Philadelphia, Pa.
Rheem Mfg. Co., Chicago, Ill.
Richmond Engineering Co., Inc., Richmond, Va.
Scaife Co., Oakmont, Pa.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Western Blower Co., Seattle, Wash.
Wood Co., John, Conshohocken, Pa.

TANKS, PROCESS AND STORAGE

Aluminum Co. of America, Pittsburgh, Pa.
American Car & Foundry Co., New York, N. Y.
American District Steam Co., Inc., North Tonawanda, N. Y.
American Hard Rubber Co., New York, N. Y. (Rubber lined)
American Moistening Co., Providence, R. I.
American Pipe & Steel Corp., Alhambra, Calif.
Armco Drainage & Metal Products, Inc., Middletown, O.
Bell & Gossett Co., Morton Grove, Ill.
Bigelow Co., New Haven, Conn.
Biggs Boiler Wks. Co., E. Akron, O.
Birchfield Boiler, Inc., Tacoma, Wash.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Bros Boiler & Mfg. Co., Wm., Minneapolis, Minn.
Buffalo Tank Corp., Dunellen, N. J.
Caldwell Co., W. E., Louisville, Ky.
Case & Son Mfg. Co., W. A., Buffalo, N. Y.
Chicago Bridge & Iron Co., Chicago, Ill.
Chicago Steel Tank Co., Chicago, Ill.
Cincinnati Metalcrafts Inc., Cincinnati, O.
Columbian Steel Tank Co., Kansas City, Mo.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Connery Construction Co., Philadelphia, Pa.
Dahlquist Mfg. Co., Div. of Process Engineering Inc., Somerville, Mass.
Day Co, The, Minneapolis, Minn.
Devine Mfg. Co., Inc., J. P., Pittsburgh, Pa.
Dillon Steam Boiler Wks., Inc., D. M., Fitchburg, Mass.
Downingtown Iron Works, Downingtown, Pa.
Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Elastic Porcelain Lining Corp., Rochester, N. Y. (Tank linings)
Erie City Iron Wks., Erie, Pa.
Falstrom Co., Passaic, N. J.
Farrar & Trefts, Buffalo, N. Y.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Finnigan & Co., Inc., J. J., Atlanta, Ga.
Frick Co., Waynesboro, Pa.
Gehri Co., Tacoma, Wash.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (chemical stoneware & porcelain)
General Fittings Co., Providence, R. I.
Gerstein & Cooper, Inc., South Boston, Mass.
Goodrich Co., B. F., Akron, O. (Rubber lined)
Graver Tank & Mfg. Co., Inc., East Chicago, Ind.
Haveg Corp., Newark, Del.
Heil Process Equipment Corp., Cleveland,

Ohio
Hodge Boiler Works, East Boston, Mass.
Hoppes Mfg. Co., Inc., Springfield, O.
International Boiler Wks., The, East Stroudsburg, Pa.
International Engineering, Inc., Dayton, O.
Kaustine Furnace & Tank Corp., Perry, N. Y.
Kelbe-Nolds, Inc., Dallas, Tex.
Kellog Co., M. W., The, New York, N. Y.
Kirk & Blum Mfg. Co., Cincinnati, O.
Knight, Maurice A., Akron, O.
Kopperman & Sons, Joseph, Philadelphia.
Koven & Bro., Inc., L. O., Jersey City, N. J.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Littleford Bros. Inc., Cincinnati, O.
Lucey Boiler & Mfg. Corp., Chattanooga, Tenn.
Lumm Co., A. H., Toledo, O.
Manitowoc Shipbuilding, Inc., Manitowoc, Wis.
Maysteel Products, Inc., Milwaukee, Wis.
Meldon Industries Div., Tool Industries, Inc., Detroit, Mich.
Mesker Steel Corp., Geo. L., Evansville, Ind.
Morrison Brothers Co., Dubuque, Ia.
Murray Iron Wks. Co., Burlington, Ia.
National Metal Fabricators, Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Nooter Corp., St. Louis, Mo.
Norse Boiler Co., Inc., New Market, N. J.
Novelty Steam Boiler Wks., Inc., Baltimore.
Patterson-Kelley Co., Inc., The, East Stroudsburg, Pa.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Pittsburgh Plate Glass Co., Pittsburgh, Pa. (glass)
Quaid Fabrications, Inc., Philadelphia, Pa.
Quaker City Iron Wks., Philadelphia, Pa.
Reco Products Div., Recony Corp., New York, N. Y.
Richmond Engineering Co., Inc., Richmond, Va.
Roessing Mfg. Co., Pittsburgh, Pa.
Rosebraugh Co., W. W., Salem, Ore.
Roth Co., Roy E., Rock Island, Ill.
Santa Fe Tank & Tower Co., Inc., Los Angeles, Calif.
Santa Fe Tank & Tower Co. of Texas, Garland, Texas
Scaife Co., Oakmont, Pa.
Sims Co., Erie, Pa.
Struthers Wells Corp., Titusville, Pa.
Terre Haute Boiler Works Co., Terre Haute, Ind.
Tippett & Wood, Phillipsburg, N. J.
U. S. Pipe & Mfg. Co., S. San Francisco.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Van Noorden Co., E., Boston, Mass.
Walsh Holyoke Boiler Wks. Div., Continental Copper & Steel Industries, Inc., Holyoke, Mass.
Western Blower Co., Seattle, Wash.
Whitlock Mfg. Co., Hartford, Conn.
Wood Co., John, Conshohocken, Pa.
Youngstown Welding & Engineering, Youngstown, O.
Zingheim Co., William C., Chicago, Ill.

TAPE, INDUSTRIAL, ADHESIVE

Boston Woven Hose & Rubber Co., Cambridge, Mass.
Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Durkee-Atwood Co., Minneapolis, Minn.
Goodrich, B. F., Akron, O.
Irvington Varnish & Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Johns-Manville, New York, N. Y.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Mystik Adhesive Products Div. of Chicago Show Printing Co., Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Owens-Corning Fiberglas Corp., Toledo, O.
Polyken Products, Dept. of the Kendall Co., Chicago, Ill.
Products Research Co., Los Angeles, Calif.
Seamless Rubber Co., The, F.O.S. Industrial Tape Div., New Haven, Conn.
United States Rubber Co., New York, N. Y.
Xylos Rubber Co., Akron, O.

TAPS, PIPE

Capewell Mfg. Co., Hartford, Conn.
Greenfield Tap & Die Corp., Greenfield, Mass.
Landis Machine Co., Inc., Waynesboro, Pa.
Nye Tool Co., Chicago, Ill.
Threadwell Tap & Die Co., Greenfield, Mass.

TELEVISION, INDUSTRIAL, CLOSED-CIRCUIT

Diamond Power Specialty Corp., Lancaster, O.
Radio Corp. of America, Engineering Products Dept., Camden, N. J.

TEMPERATURE AND HUMIDITY CONTROLS

See Humidistats; Recorder-Controllers; Thermostats

TEMPERATURE RECORDERS

See Recorders, Temperature

TEMPERATURE REGULATORS

See Regulators, Temperature

TEMPLATES, DRAWING, PIPING

Dietzgen Co., Eugene, Chicago, Ill.
Graphic Indicator Co., Los Angeles, Calif.
Ree Associates, Bogota, N. J. (for marking contour lines on pipe)

TEST CHAMBERS

See Chambers, Test, Controlled Temperature and Humidity

TESTERS, DUST SPOT, FOR AIR FILTERS

Trerice Co., H. O., Detroit, Mich.
Trion, Inc., McKees Rocks, Pa.

TESTERS, GAGE, DEAD WEIGHT

American Instrument Co., Inc., Silver Spring, Md.
Ashton Valve Co., Cambridge, Mass.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green, Cleveland, O.
Trerice Co., H. O., Detroit, Mich.

TESTERS, LEAK, FOR PIPING AND VESSELS

American Gas & Chemical, Inc., New York.
American Pipe & Steel Corp., Alhambra, Calif.
Dudgeon, Inc., Richard, Brooklyn, N. Y.
Greer Hydraulics, Inc., Brooklyn, N. Y.
Johnson-Williams Ltd., Palo Alto, Calif.
Universal Controls Corp., Dallas, Tex.
Whittington Pump & Engineering Corp., Indianapolis, Ind.

TESTERS, MOISTURE

Brabender Corp., Rochelle Park, N. J.
Weston Electrical Instrument Corp., Newark, N. J.

TESTERS, SOUND, FOR LOCATING MECHANICAL TROUBLES

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Marsh Instrument Co., Skokie, Ill.

TESTERS, SMOKE

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Marsh Instrument Co., Skokie, Ill.
McNeill Engineering Co., Chicago, Ill.
Victory Engineering Corp., Union, N. J.

THAWERS, PIPE, ELECTRIC, PORTABLE

General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
General Electric Co., Construction Materials Div., Bridgeport, Conn.
Harold Electric Co., Walla Walla, Wash.
Hobart Bros. Co., Troy, O.
Trindl Products, Ltd., Chicago, Ill.

THERMOMETER WELLS

See Wells, Thermometer

THERMOMETERS, INDICATING, INDUSTRIAL

Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Bailey Meter Co., Cleveland, O.
Bristol Co., The, Waterbury, Conn.
Dillon Co., Inc., W. C., Forest Park, Ill.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Equipoise Controls, Mount Vernon, N. Y.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hill & Co., E. Vernon, Lake Geneva, Ill.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Leeds & Northrup Co., Philadelphia, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Moeller Instrument Co., Richmond Hill, N. Y.
New York Air Valve Corp., Brooklyn, N. Y.
Pacific Transducer Corp., Los Angeles, Calif. (for surface temperatures)
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Philadelphia Thermometer Co., Philadelphia.
Powers Regulator Co., Skokie, Ill.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Preferred Utilities Mfg. Corp., New York.
Pyrometer Instrument Co., Inc., The, Bergenfield, N. J.
Rochester Mfg. Co., Rochester, N. Y.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of America Machine and Metals, Inc., Sellersville, Pa.
Velan Engineering Co., Havertown, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

THERMOMETERS, INDICATING, PIPE SURFACE

Pacific Transducer Corp., Los Angeles, Calif.

THERMOMETERS, INDICATING, REMOTE-READING

Airguide Instrument Co., Chicago, Ill.
Bailey Meter Co., Cleveland, O.
Beckman & Whitley, Inc., San Carlos, Calif.
Bristol Co., The, Waterbury, Conn.
Defender Instrument & Regulator Co., St. Louis, Mo.
Dickson Co., The, Chicago, Ill.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc, Chicago, Ill.
H-B Instrument Co., Philadelphia, Pa.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
Marshalltown Mfg. Co., Marshalltown, Ia.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.

Moeller Instrument Co., Richmond Hill, N. Y.
Moore Products Co., Philadelphia, Pa.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Philadelphia Thermometer Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Pyrometer Instrument Co., Inc., The, Bergenfield, N. J.
Rochester Mfg. Co., Rochester N. Y.
Sarco Co., Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thompson Research & Mfg. Co., Davenport, Fla.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y.
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., Newark, N. J.

THERMOMETERS, INDICATING, WALL

Airguide Instrument Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Foxboro Co., Foxboro, Mass.
G. M. Mfg. Co., New York, N. Y.
Garden City Instruments, Inc., Chicago, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
H-B Instrument Co., Philadelphia, Pa.
Hausman Mfg. & Sales Co., Chicago, Ill. (Indicates both temperature and humidity, showing comfort zone)
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Moeller Instrument Co., Richmond Hill, N. Y.
Palmer Thermometers, Inc., Cincinnati (Norwood), O.
Philadelphia Thermometer Co., Philadelphia, Pa.
Precision Thermometer & Instrument Co., Philadelphia, Pa.
Pyrometer Instrument Co., Inc., The, Bergenfield, N. J.
Sarco Co., Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Taylor Instrument Companies, Rochester, N. Y.
Thwing-Albert Instrument Co., Philadelphia, Pa.
Trerice Co., H. O., Detroit, Mich.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
Weksler Thermometer Corp., Freeport, N. Y. (Effective temperature indicator)
West Instrument Corp., Chicago, Ill.
Weston Electrical Instrument Corp., Newark, N. J.
Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

THERMOMETERS, KATA

G. M. Mfg. Co., New York, N. Y.
Hausman Mfg. & Sales Co., Dept. HP, Chicago, Ill.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Precision Thermometer & Instrument Co., Philadelphia, Pa.

THERMOSTATIC BELLOWS

See Bellows, Thermostatic and Metallic

THERMOSTATIC BI-METALS

See Bi-Metals, Thermostatic

THERMOSTATIC TRAPS

See Traps, Steam, Thermostatic

THERMOSTATS, DUCT TYPE

American District Telegraph Co., New York, N. Y.
Atlas Valve Co., Newark, N. J.
Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Burling Instrument Co., Chatham, N. J.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Cooper Co., Clark, Palmyra, N. J.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fenwal Inc., Ashland, Mass.
Johnson Service Co., Milwaukee, Wis.
Leslie Co., Lyndhurst, N. J.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Moeller Instrument Co., Richmond Hill, N. Y.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scaico, Inc., Palmyra, N. J.
Smith Control & Instrument Corp., Palmyra, N. J.
Stevens Mfg. Co., Inc., Mansfield, O.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Wesix Electric Heater Co., San Francisco, Calif.
Wiegand Co., Edwin L., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.

THERMOSTATS, EFFECTIVE TEMPERATURE

Cooper Co., Clark, Palmyra, N. J.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Sarcotherm Controls, Inc., New York, N. Y.
Therm-O-Disc, Inc., Mansfield, O.

THERMOSTATS, IMMERSION

Atlas Valve Co., Newark, N. J.
Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Black, Sivalls & Bryson, Inc., Kansas City, Mo.
Burling Instrument Co., Chatham, N. J.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Cooper Co., Clark, Palmyra, N. J.
Detroit Controls Corp., Detroit, Mich.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Fenwal Inc., Ashland, Mass.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
General Controls Co., Glendale, Calif. and Skokie, Ill.
H-B Instrument Co., Phiadelphia, Pa.
Hart Mfg. Co., Hartford, Conn.
Industrial Engineering Corp., Terre Haute, Ind.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
Leslie Co., Lyndhurst, N. J.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Philadelphia Thermometer Co., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scaico, Inc., Palmyra, N. J.
Smith Control & Instrument Corp., Palmyra, N. J.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Sullivan Valve & Engineering Co., Butte, Mont.
Superior Controls Co., Inc., Los Angeles, Calif.
Thwing-Albert Instrument Co., Philadelphia.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Vulcan Electric Co., Danvers, Mass.
Wesix Electric Heater Co., San Francisco, Calif.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.
Wilcolator Co., Elizabeth, N. J.

THERMOSTATS, RADIANT HEAT

Automatic Devices Co., Inc., Western Springs, Ill.
Detroit Controls Corp., Detroit, Mich.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Mercoid Corp., The, Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Therm-O-Disc, Inc., Mansfield, O.
Thrush & Co., H. A., Peru, Ind.
White-Rodgers Electric Co., St. Louis, Mo.

THERMOSTATS, ROOM OR WALL

A-P Controls Corp., Milwaukee, Wis.
Acro Mfg. Co., The, Columbus, O.
Armstrong Machine Wks., Three Rivers, Mich.
Au-Temp-Co Corp., New York, N. Y.
Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Crown Controls Co., Inc., New Bremen, O.
Detroit Controls Corp., Detroit, Mich.
General Controls Co., Glendale, Calif. and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Gleason-Avery, Inc., Auburn, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Industrial Engineering Corp., Terre Haute, Ind.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
McCorkle Co., D. H., Berkeley, Calif.
McQuay-Norris Mfg. Co., St. Louis, Mo.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Powers Regulator Co., Skokie, Ill.
Roberson Co., L. N., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Soreng Products Corp., Schiller Park, Ill.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Thrush & Co., H. A., Peru, Ind.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
Wesix Electric Heater Co., San Francisco.
White-Rodgers Electric Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, SURFACE

Au-Temp-Co Corp., New York, N. Y.
Barber-Colman Co., Rockford, Ill.
Cam-Stat, Inc., Div. of The Paul Henry Co., Los Angeles, Calif.
Cooper Co., Clark Palmyra, N. J.
Detroit Controls Corp., Detroit, Mich.
Fenwal Inc., Ashland, Mass.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hart Mfg. Co., Hartford, Conn.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Industrial Engineering Corp., Terre Haute, Ind.
Johnson Service Co., Milwaukee, Wis.
McCorkle Co., D. H., Berkeley, Calif.
Mechanical Industries Production Co., Akron, O.
Mercoid Corp., The, Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Powers Regulator Co., Skokie, Ill.
Red Spot Electric Co., Tacoma, Wash.
Roberson Co., L. N., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.

Scaico, Inc., Palmyra, N. J.
Smith Control & Instrument Corp., Palmyra N. J.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Stevens Mfg. Co., Inc., Mansfield, O.
Therm-O-Disc, Inc., Mansfield, O.
Triplex Heating Specialty Co., Inc., Peru, Ind.
United Electric Controls Co., Watertown, Mass.
Westinghouse Electric Corp., Pittsburgh, Pa.
White-Rodgers Electric Co., St. Louis, Mo.
Wiegand Co., Edwin L., Pittsburgh, Pa.

THERMOSTATS, TWO TEMPERATURE OR DUAL

Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Burling Instrument Co., Chatham, N. J.
Detroit Controls Corp., Detroit, Mich.
General Controls Co., Glendale, Calif. and Skokie, Ill.
H-B Instrument Co., Philadelphia, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Industrial Engineering Corp., Terre Haute, Ind.
Iron Fireman Mfg. Co., Cleveland, O.
Johnson Service Co., Milwaukee, Wis.
Mercoid Corp., The, Chicago, Ill.
Miller-Harris Instrument Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Perfex Corp., Milwaukee, Wis.
Powers Regulator Co., Skokie, Ill.
Roberson Co., L. N., Seattle, Wash.
Sarco Co., Inc., New York, N. Y.
Sarotherm Controls, Inc., New York, N. Y.
Soreng Products Corp., Schiller Park, Ill.
United Electric Controls Co., Watertown, Mass.
Vapor Heating Corp., Chicago, Ill.
White-Rodgers Electric Co., St. Louis, Mo.

THERMOSTATS, WEATHER COMPENSATING

Automatic Devices Co., Inc., Western Springs, Ill.
Barber-Colman Co., Rockford, Ill.
Crown Controls Co., Inc., New Bremen, O.
Detroit Controls Corp., Detroit, Mich.
Edison, Inc., Thomas A., Instrument Div., West Orange, N. J.
Heat Timer Corp., New York, N. Y.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
McLarty Systems, Battle Creek, Mich.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarotherm Controls, Inc., New York, N. Y.
Tallmadge, Webster, Systems, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
United Electric Controls Co., Watertown, Mass.
White-Rodgers Electric Co., St. Louis, Mo.

TIME SWITCHES

See Switches, Time

TOGGLE BOLTS

See Bolts, Toggle and Anchor

TONGS, PIPE

Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Williams & Co., J. H., Buffalo, N. Y.

TOOLS (CHISELS, PLIERS, SCREW DRIVERS, ETC.)

Badger Sales Co., Inc., Los Angeles, Calif. (magnifying inspectoscope for inspection of hard-te-get-at places)
Barton Products, Inc., Wheaton, Ill. (flexible shaft grinding wheel and wire brush)
Billings & Spencer Co., Hartford, Conn.
Birks Mfg. Co., Meriden, Conn. (Pittsburgh lock seam opener)
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Boston Machine Works Co., Lynn, Mass. (nozzle extractor)
Carlson & Sullivan, Monrovia, Calif. (steel tape rule for reading diameter)
Churchward Welding Accessories, Jack, North Haven, Conn. (scaling hammer)
Clipper Mfg. Co., Kansas City, Mo. (masonry saws and blades for cutting firebrick for furnace linings; concrete saws and blades for sawing trenches, patches, and machinery bases in concrete floors and drives; portable hoists for lifting firebrick, etc.; dust hoods, to exhaust dust when cutting dry with the masonry saw.
Crescent Tool Co., Jamestown, N. Y.
Dreier Brothers, Inc., Chicago, Ill. (level for determining pitc of pipe)
Duro Metal Products Co., Chicago, Ill.
Duro-Dyne Corp., New Hyde Park, L. I., N. Y. (file handles and solder iron handles)
Everhot Products Co., Chicago, Ill.
Franklin Dalmar Corp., Baltimore 11, Md.
Gel-Me Co., Bloomington, Ill. (electric sound probe for locating mechanical trouble)
Gibson Industries, Inc., Muskegon, Mich. (for closing Pittsburgh lock)
Greene, Tweed & Co., North Wales, Pa.
Greenlee Tool Co., Div. of Greenless Bros. & Co., Rockford, Ill.
Harris, A. R., Hammond, Ind.
Hausman Mfg. & Sales Co., Dept. HP, Chicago, Ill.
Hexdall Co., A. M., Morris, Ill. (Pittsburgh lock hammers, tee hammers, seam openers)
Howes-Wood Co., Cambridge, Mass.
Independent Blade Corp., Joliet, Ill. (plastic cutting & other saw blades)
Ingersoll-Rand Co., New York, N. Y.
Interstate Sales Co., New York, N. Y. (Protractor for layout work and center-finder protractor; angle meters for pipe layout)
Lane Shur-Grip Tool Co., Chicago, Ill. (pliers)
Levow, David, New York, N. Y. (3 way clamp)
Lufkin Rule Co., Saginaw, Mich. (steel tapes and folding rules)
Markal Co., Chicago, Ill. (markers for hot surfaces)
Mid-States Welder Mfg Co., Chicago, Ill. (heavy duty power saw and file)
Millers Falls Co., Greenfield, Mass.
Milwaukee Electric Tool Corp., Milwaukee, Wis. (portable electric screw drivers and hammers)
Misener Mfg. Co., Inc., Syracuse, N. Y. hole saws)
Owens Co., H., Culver City, Calif. (pattern developer tool for sheet metal work)
Pioneer Tool Co., Racine, Wis.
Producers & Distributors, Inc., Allentown, Pa. (metal saw to attach to electric drill)
R C S Tool Sales Corp., Joliet, Ill. (reciprocating saw attachment; right angle drill attachments)
Ramset Div., Olin, Mathieson Chemical Corp., Cleveland, O. (powder-actuated tools)
Rawplug Co., Inc., The, New York, N. Y. (drills for masonry)
Refrigeration Devices Co., Nutley, N. J. (oiler for refrigeration compressors)
Richmont, Inc., Monrovia, Calif.
Rotary Concrete Drill Co., Pasadena, Calif. (Drill bits)
Rotor Tool Co., Cleveland, O.
Salsbury Corp., Los Angeles, Calif. (air hammer)
Schild Mfg. Co., Dallas Tex.
Snap-on Tools Corp., Kenosha, Wis.
Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago (Cicero), Ill. (Portable electric saw)
Stanley Works, The, New Britain, Conn.
Thompson & Son Co., The Henry G., New Haven, Conn.
Wassco Electric Products Corp., Joliet, Ill. (soldering pliers for copper tubing)
Williams & Co., J. H., Buffalo, N. Y.

TOOLS, FLARING, FOR TUBING

Armstrong Bros. Tool Co., Chicago, Ill.
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Capewell Mfg. Co., Hartford, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Duro Metal Products Co., Chicago, Ill.
Everhot Products Co., Chicago, Ill.
Flodar Corp., Cleveland, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Kent-Moore Organization, Inc., Detroit, Mich.
Key Co., East St. Louis, Ill.
Madden Brass Products Co., Aurora, Ill.
Mueller Co., Decatur, Ill.
Parker Appliance Co., The, Cleveland, O.
Penn Brass & Copper Co., Erie, Pa.
Research Vacuum Supply Co., Chicago, Ill. (Press gears)
Sac Tool Mfg. Co., St. Louis, Mo.
Schaul Mfg. Co., Cleveland, Ohio
Snap-On Tools Corp., Kenosha, Wis.
Talon Tools, Inc., North Arlington, N. J.
Weatherhead Co., Cleveland, O.
Williams & Co., J. H., Buffalo, N. Y.
Wilson, Inc., Thomas C., Long Island City, N. Y.

TORCHES, BRAZING AND SOLDERING

Aeroil Products Co., Inc., South Hackensack, N. J.
Air Reduction Sales Co., New York, N. Y.
Atlas Welding Accessories, Co., Ferndale, Mich.
Bernz Co., Otto, Rochester, N. Y.
Borm Mfg. Co., Elgin, Ill.
Clayton & Lambert Mfg. Co., Louisville, Ky.
Deutsch Co., The, Los Angeles, Calif.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Ergolyte Mfg. Co., Philadelphia, Pa.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Garden City Industries, Inc., Chicago, Ill. (soldering guns)
General Scientific Equipment Co., Philadelphia, Pa.
Goss Gas, Inc., Pittsburgh, Pa.
Harris Calorific Co., The, Cleveland, O.
Ideal Industries, Inc., Sycamore, Ill.
Industrial Gas Div., Liquid Carbonic Corp., Chicago, Ill.
Insto-Gas Corp., Detroit, Mich.
Johnson Gas Appliance Co., Cedar Rapids, Ia.
K-G Equipment Co., Allentown, Pa.
Lee Co., K. O., Aberdeen, S. D.
Lenk Mfg. Co., Boston, Mass.
Linde Air Products Co., The, Unit of Union Carbide & Carbon Corp., New York, N. Y.
Liquid Carbonic Corp., The, Chicago, Ill.
Marquette Mfg. Co., Minneapolis, Minn.
Mass Co., Davenport, Ia.
Mid-States Welder Mfg. Co., Chicago, Ill.
Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Modern Engineering Co., St. Louis, Mo.
National Cylinder Gas Co., Chicago, Ill.
Polis Mfg. Co., J. D., Chicago, Ill.
Powder Weld Process Co., The, Brooklyn, N. Y.
Prepo Corp., Edgerton, Wis.
Reiner & Campbell Co., Inc., Newark, N. J.
Research Vacuum Supply Co., Chicago, Ill.
Sac Tool Mfg. Co., St. Louis, Mo.
Sight Feed Generator Co., West Alexandria, O.
Smith Welding Equipment Corp., Minneapolis, Minn.
Torit Mfg. Co., St. Paul, Minn.
Trindl Products, Ltd., Chicago, Ill.
Turner Brass Works, The, Sycamore, Ill.
Velocity Power Tool Co., Div. of Mine Safety Appliance Co., Pittsburgh, Pa.
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich. (for L-P gas)
Will-Weld Mfg. Co., Inc., Omaha, Neb.

TORQUE INDICATING WRENCHES

See Wrenches, Torque Indicating

TOWERS, COOLING, ATMOSPHERIC

American Cooling Tower Co., Kansas City, Mo.
Binks Mfg. Co., Chicago, Ill.
Dover Mfg. Co., Independence, Mo.
Fluor Corp., Ltd., The, Los Angeles, Calif.
Harry Cooling Towers, Inc., New York, N. Y.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Lilie-Hoffmann Cooling Towers, Inc., St. Louis, Mo.
Marley Co., The, Kansas City, Mo.
New England Cooling Tower Co., Quincy, Mass.

Pennsylvania Engineering Wks., New Castle, Pa.
Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Pritchard & Co. of California, J. F. Kansas City, Mo.
Santa Fe Tank & Tower Co., Inc., Los Angeles, Calif.
Santa Fe Tank & Tower Co., Garland, Tex.
Stewart Ice Machine Co., Pomona, Calif.
Sun-Fire Stoker Corp., New Albany, Ind.
TOT Towers, Inc., Houston, Tex.
Thermal Agency, Houston, Tex.
Toungate & Coats, Austin, Tex.
United Cooling Tower Co., Kansas City, Mo.
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.

TOWERS, COOLING, MECHANICAL DRAFT

Acme Equipment Co., Muskogee, Okla.
Acme Industries, Inc., Jackson, Mich.
Air & Refrigeration Corp., New York, N. Y.
American Cooling Tower Co., Kansas City, Mo.
Aqua-Therm, Inc., Dayton, O.
Baltimore Aircoil Co., Inc., Baltimore, Md.
Binks Mfg. Co., Chicago, Ill.
Buensod-Stacey, Inc., New York, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y,
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Crowell & Dunn, Inc., New York, N. Y.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Drayer-Hanson, Inc., Los Angeles, Calif.
Dover Mfg. Co., Independence, Mo.
Flight Mfg. Corp., Camden, N. J.
Fluor Corp., Ltd., The, Los Angeles, Calif.
Foster Wheeler Corp., New York, N. Y.
Goodfellow Co., Inc., E. D., Memphis, Tenn.
Governair Corp., Oklahoma City, Okla.
Halstead & Mitchell, Pittsburgh, Pa.
Harry Cooling Towers, Inc., New York, N. Y.
Havens Structural Steel Co., Kansas City, Mo.
Hydrocol-Air-Sanitation, Inc., New York, N. Y.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kelbe-Nolds, Inc., Dallas, Tex.
Kennard Corp., St. Louis, Mo.
Kramer-Trenton Co., Trenton, N. J.
Lakewood Engineering & Mfg. Co., Chicago, Ill.
Larkin Coils, Inc., Atlanta, Ga.
Lilie-Hoffmann Cooling Towers, Inc., St. Louis, Mo.
Marley Co., The, Kansas City, Mo.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Morris Sheet Metal Works, Columbus, O.
New England Cooling Tower Co., Quincy, Mass.
Niagara Products Co., Phoenix, Ariz.
Pennsylvania Engineering Wks., New Castle, Pa.
Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Pritchard & Co. of California, J. F. Kansas City, Mo.
Reco Products Div., Recony Corp., New York, N. Y.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Santa Fe Tank & Tower Co. of Texas, Garland, Tex.
Santa Fe Tank & Tower Co., Inc., Los Angeles, Calif.
Servel, Inc., Evansville, Ind.
Silco Products, Inc., Minneapolis, Minn.
Sun-Fire Stoker Corp., New Albany, Ind.
Super-Cold Corp., Los Angeles, Calif.
Tenney Engineering Inc.,Union, N. J.
TOT Towers, Inc., Houston, Tex.
Toungate & Coats, Austin, Tex.
United Cooling Tower Co., Kansas City, Mo.
United States Air Conditioning Corp., Minneapolis, Minn.
Vogt Machine Co., Henry, Louisville, Ky. (packaged unit with condenser, pump, etc.)
Water Cooling Corp., New York, N. Y.
Water Cooling Equipment Co., St. Louis, Mo.
Worthington Corp., Harrison, N. J.

TOWERS, COOLING, NOISE ELIMINATION FOR

See Noise Elimination for Cooling Towers

TRANSFORMERS, ELECTRIC

Acme Electric Corp., Cuba, N. Y.
Arjac Products Inc., Rochester, N. Y.
Birdsell Mfg. Co., Inc., Palo Alto, Calif.
Crown Controls Co., Inc., New Bremen, O.
Dormeyer Industries, Chicago, Ill.
Eisler Engineering Co., Inc., Newark, N. J.
Essex Wire Corp., Ft. Wayne, Ind.
General Controls Co., Glendale, Calif., and Skokie, Ill.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Hindle Transformer Co., Inc., Flemington, N. J.
Jefferson Electric Co., Bellwood, Ill.
Line Material Co., Milwaukee, Wis.
Magnex Corp., Jamaica, N. Y. (oil burner ignition)
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Rex Welder & Engineering Co., Kansas City, Mo.
Sola Electric Co., Chicago, Ill. (voltage regulating)
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Taylor-Winfield Corp., Warren, O.
Trindl Products, Ltd., Chicago, Ill.
Union Electric & Mfg. Co., Jersey City, N. J.
Wagner Electric Corp., St. Louis, Mo.
Webster Electric Co., Racine, Wis.
Westinghouse Electric Corp., Pittsburgh, Pa.

TRANSMISSION DRIVES

See Drives, Chain, Flat Belt and V-Belt

TRANSMITTERS, PRESSURE AND TEMPERATURE

Bristol Co., The, Waterbury, Conn.
Control Engineering Corp., Controls Div., Norwood, Mass.
Cooper Co., Clark, Palmyra, Pa.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Taylor Instrument Companies, Rochester, N. Y.

TRAPS, MAGNETIC, FOR REMOVING TRAMP IRON FROM PIPE LINES

Columbia Engineering Service Co., Santa Rosa, Calif.
Dings Magnetic Separator Co., Milwaukee.

TRAPS, STEAM, FLOAT-THERMOSTATIC

American District Steam Co., Inc., North Tonawanda, N. Y.
Bailey Co., Chas. M., San Francisco, Calif.
Barnes & Jones, Inc., Jamaica Plain, Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Cochrane Corp., Philadelphia, Pa.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Davis Regulator Co., Chicago, Ill.
Dunham Co., C. A., Chicago, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Marsh Heating Equipment Co., Skokie, Ill.
Monash-Younker Co., Inc., Chicago, Ill.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trerice Co., H. O., Detroit, Mich.
Webster & Co., Warren, Camden, N. J.
Wright-Austin Co., Detroit, Mich.

TRAPS, STEAM, MECHANICAL

Acker Organization, Inc., W. M. Meridian, Miss.
American District Steam Co., Inc., North Tonawanda, N. Y.
Anderson Co., V. D., The, Cleveland, O.
Armstrong Machine Wks., Three Rivers, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Barnes & Jones, Inc., Boston, Mass.
Boylston Steam Specialty Co., Chicago, Ill.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Burrows Mfg. Co., F. A., York, Pa.
Cashin Co., W. D., Boston, Mass.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Coe Mfg. Co., Painesville, O.
Crane Co., Chicago, Ill.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Ellis Drier Co., Chicago, Ill.
Fisher Governor Co., Marshalltown, Ia.
Haines & Co., Inc., William S., Div. Sellers Injector Corp., Philadelphia, Pa.
Healy Ruff Co., St. Paul, Minn.
Hoffman Specialty Mfg. Corp., Indianapolis Ind.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Johnson Corp., The, Three Rivers, Mich.
Justus Steam Trap Co., Napanoch, N. Y.
Kaye & MacDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Chicago, Ill.
Leavitt Machine Co., Orange, Mass.
Marsh Heating Equipment Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
McAuley Trap Co., Pittsburgh, Pa.
Milwaukee Valve Co., Milwaukee, Wis.
Monash-Younker Co., Inc., Chicago, Ill.
Morehead Mfg. Co., Detroit, Mich.
Nason Co., Clarkston, Mich.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Perfecting Service Co., Charlotte, N. C.
Rockwell Co., W. S., Fairfield, Conn.
Sarco Co., Inc., New York, N. Y.
Schaub Engineering Co., Fred H., Chicago, Ill.
Squires Co., C. E., The, Cleveland, O.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Sterling, Inc., Milwaukee, Wis.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond Co., Cleveland, O.
Templeton Bros., Hyde Park, Mass.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Velan Engineering Co., Jersey City, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Webster & Co., Warren, Camden, N. J.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.
Wright-Austin Co., Detroit, Mich.
Yarnall-Waring Co., Philadelphia, Pa.

TRAPS, STEAM, THERMOSTATIC

American District Steam Co., Inc., North Tonawanda, N. Y.
Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
Dunham Co., C. A., Chicago, Ill.
Haines & Co., Inc., William S., Div. Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Keckley Co., O. C., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Monash-Younker Co., Inc., Chicago, Ill.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Simplex Heating Specialty Co., Inc., Lynchburg, Va.
Squires Co., C. E., The, Cleveland, O.
Sterling Engineering & Mfg. Corp., Hyde Park, Mass.
Sterling, Inc., Milwaukee, Wis.
Templeton Bros., Hyde Park, Mass.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.

Vapor Heating Corp., Chicago, Ill.
Velan Engineering Co., Jersey City, N. J.
Webster & Co., Warren, Camden, N. J.

TREATMENT, FUEL OIL, TO PREVENT SLUDGE

Allen Co., Robert G., Mechanicsville, N. Y.
Alrose Chemical Co., Providence, R. I.
American Sand-Banum Co., Inc., New York, N. Y.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Bird-Archer Co., Philadelphia, Pa.
Black & White Chemical Co., New York, N. Y.
Celco Corp., New York, N. Y.
Drew & Co., Inc., E. F., New York, N. Y.
Eds-Wil Burner Corp., Chicago, Ill.
Elraco Engineering Co., Los Angeles, Calif.
Evis Corp. of America, Dallas, Tex.
Hercules Chemical Co., Inc., New York, N. Y.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
National Airoil Burner Co., Inc., Philadelphia, Pa.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
O'Brien Industries, Caldwell, N. J.
Perolin Co., Inc., Chicago, Ill.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Radiator Specialty Co., Charlotte, N. C.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Sudbury Laboratory, South Sudbury, Mass.
Utility Laboratory, Inc., Brooklyn, N. Y.
Warren Refining & Chemical Co., The, Cleveland, O.
Western Chemical Co., Kansas City, Mo.

TREATMENT, STEAM SYSTEM, TO INHIBIT CORROSION

Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Water Softener Co., Philadelphia, Pa.
American Well Wks., Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown Electro Co., Oklahoma City, Okla.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Cochrane Corp., Philadelphia, Pa.
Continental Products Co., Euclid, O.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Elgin Softener Corp., Elgin, Ill.
Elraco Engineering Co., Los Angeles, Calif.
Graver Water Conditioning Co., New York, N. Y.
Hagan Corp., Pittsburgh, Pa.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hercules Chemical Co., Inc., New York, N. Y.
Kenite Laboratory, Inc., Madison, N. J.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
McRay Sales Co., South Pasadena, Calif.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
O'Brien Industries, Caldwell, N. J.
Perolin Co., Inc., Chicago, Ill.
Proportioneers, Inc., Div. of B-I-F Industries, Inc. Providence, R. I.
Rid-Sludge Div., Aulwood Mfg. Co., St. Paul, Minn. (vapor treatment to remove sludge from heating system)
Saverite Engineering Co., Hoboken, N. J.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Strong, Carlisle & Hammond Co., Cleveland, O.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Utility Laboratory, Inc., Brooklyn 32, N. Y.
Warren Refining & Chemical Co., Cleveland, O.
Water Control Engineering Co., Kansas City, Mo.
Water Treatment Co. of America, Pittsburgh, Pa.
Western Chemical Co., Kansas City, Mo.
X Laboratories, Inc., New York, N. Y.

TREATMENT, WATER, TO INHIBIT CORROSION

Agava Products, Inc., Jersey City, N. J.
Allis-Chalmers Mfg. Co., Milwaukee, Wis.
American Cyanamid & Chemical Corp., New York, N. Y.
American K. A. T. Corp., Garwood, N. J.
American Sand-Banum Co., Inc., New York, N. Y.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown Electro Co., Oklahoma City, Okla.
Calgon, Inc., Pittsburgh, Pa.
Cannon Chemical Co., Inc., Cambridge, Mass.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Chemical Engineering Co., Dallas, Tex.
Chemical & Metallurgical Products, Inc., New York, N. Y.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Cochrane Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Culligan Inc., Northbrook, Ill.
Dearborn Chemical Co., Chicago, Ill.
Drew & Co., Inc., E. F., New York, N. Y.
Elgin-Refinite, Div. of Elgin Softener Corp., Elgin, Ill.
Elgin Softener Corp., Elgin, Ill.
Elraco Engineereing Co., Los Angeles, Calif.
Evis Corp. of America, Dallas, Tex.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Fischer & Porter Co., Hatboro, Pa.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York, N. Y.
Grief, Edward C., Bogota, N. J.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hagan Corp., Pittsburgh, Pa.
Hungerford & Terry, Inc., Clayton, N. J.
Industrial Filter & Pump Co., Chicago, Ill.
Layne & Bowler, Inc., Memphis, Tenn.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
Maintenance Engineering Corp., Houston, Tex.
McRay Sales Co., South Pasadena, Calif.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Monsanto Chemical Co., St. Louis, Mo.
Moreheat Distribution, Inc., Cincinnati, O.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
O'Brien Industries, Caldwell, N. J.
Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I.
Permutit Co., New York, N. Y.
Perolin Co., Inc., Chicago, Ill.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Research Products Corp., Madison, Wis.
Reynolds Shaffer Co., Detroit, Mich.
Saverite Engineering Co., Hoboken, N. J.
Schror, Dr. Adolph, East Orange, N. J.
S. O. S. Products Co., Inc., Brooklyn, N. Y.
Strong, Carlisle & Hammond Co., Cleveland, O.
Sudbury Laboratory, South Sudbury, Mass.
Sulflo, Inc., Elizabeth, N. J.
Turco Products, Inc., Los Angeles, Calif.
Uniflow Mfg. Co., Erie, Pa.
Wallace & Tiernan Co., Inc., Newark, N. J.
Warlo Corp., New York, N. Y.
Water Control Engineering Co., Kansas City, Mo.
Water Service Laboratories, Inc., New York, N. Y.
Water Treatment Company of America, Pittsburgh, Pa.
Western Chemical Co., Kansas City, Mo.
Worthington Corp., Harrison, N. J.
X Laboratories, Inc., New York, N. Y.

TREATMENT, WATER, TO PREVENT SCALE FORMATION

Agava Products, Inc., Jersey City, N. J.
American Sand-Banum Co., Inc., New York, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Aqua Electric Scale Control, Inc., Cleveland, O.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown-Electro Co., Oklahoma City, Okla.
Calgon, Inc., Pittsburgh, Pa.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Clayton Mfg. Co., El Monte, Calif.
Cochrane Corp., Philadelphia, Pa.
Drew & Co., Inc., E. F., New York, N. Y.
Elraco Engineering Co., Los Angeles, Calif.
Evis Corp. of America, Dallas, Tex.
General Filter Co., Ames, Ia.
Graver Water Conditioning Co., New York, N. Y.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hungerford & Terry, Inc., Clayton, N. J.
Madden Corp., Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
McMillan Industrial Supplies, C. C., Portland, Ore.
National Aluminate Corp., Chicago, Ill.
Perolin Co., Inc., The, Chicago, Ill.
Permutit Co., New York, N. Y.
Reynolds Shaffer Co., Detroit, Mich.
S. O. S. Products Co., Inc., Brooklyn, N. Y.

TREATMENT, WATER, FOR SLIME AND ALGAE CONTROL

Agava Products Inc., Jersey City, N. J.
Alrose Chemical Co., Providence, R. I.
American Water Softener Co., Philadelphia, Pa.
American Well Works, Aurora, Ill.
Ampion Corp., Long Island City, N. Y.
Anderson Chemical Co., Inc., Macon, Ga.
Anderson-Stolz Corp., Kansas City, Mo.
Aqua Electric Scale Control, Inc., Cleveland, O.
Aquatrol Laboratories, Inc., Clifton, N. J.
Bird-Archer Co., Philadelphia, Pa.
Brown Electro Co., Oklahoma City, Okla.
Builders Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Carolina Aniline & Extract Co., Charlotte, N. C.
Chemical Engineering Co., Dallas, Tex.
Chemical Solvent Co., Birmingham, Ala.
Cooper Co., Clark, Palmyra, N. J.
Dearborn Chemical Co., Chicago, Ill.
Dow Chemical Co., The, Midland, Mich.
Drew & Co., Inc., E. F., New York, N. Y.
Elgin-Refinite, Div. of Elgin Softener Corp., Elgin, Ill.
Elraco Engineering Co., Los Angeles, Calif.
Evis Corp. of America, Dallas, Tex.
Filtrine Mfg. Co., Inc., Brooklyn, N. Y.
Fischer & Porter Co., Hatboro, Pa.
General Filter Co., Ames, Ia.
General Ozone Corp., Chicago, Ill.
Graver Water Conditioning Co., New York, N. Y.
Haering & Co., Inc., D. W., San Antonio, Tex.
Hagan Corp., Pittsburgh, Pa.
Hungerford & Terry, Inc., Clayton, N. J.
Layne & Bowler, Inc., Memphis, Tenn.
Madden Corp., The, Chicago, Ill.
Magnus Chemical Co., Garwood, N. J.
McRay Sales Co., South Pasadena, Calif.
Metropolitan Refining Co., Inc., Long Island City, N. Y.
Milton Roy Co., Philadelphia, Pa.
Monsanto Chemical Co., St. Louis, Mo.
National Aluminate Corp., Chicago, Ill.
North American Mogul Products Co., The, Cleveland, O.
Norwood Associated Engineers, Inc., Springfield, Mass.
Oakite Products, Inc., New York, N. Y.
O'Brien Industries, Caldwell, N. J.

Omega Machine Co., Div. of B-I-F Industries, Inc., Providence, R. I.
Perolin Co., Inc., Chicago, Ill.
Permutit Co., New York, N. Y.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Solvay Process Div., Allied Chemical & Dye Corp., New York, N. Y.
Steelcote Mfg. Co., St. Louis, Mo.
Wallace & Tiernan Co., Inc., Newark, N. J.
Water Treatment Co. of America, Pittsburgh, Pa.
Western Chemical Co., Kansas City, Mo.

TRY-COCKS, BOILER

Chicago Specialty Mfg. Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Detroit Brass & Malleable Co., Detroit, Mich.
Diamond Power Specialty Corp., Lancaster, O.
Eclipse Fuel Engineering Co., Rockford, Ill.
Huyette Co., Inc., Paul B., Philadelphia, Pa.
Keckley Co., O. C., Chicago, Ill.
New York Air Valve Corp., Brooklyn, N. Y.
Penberthy Injector Co., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Robert Mfg. Co., Los Angeles, Calif.
Roessing Mfg. Co., Pittsburgh, Pa.
Superior Controls Co., Inc., Los Angeles, Calif.

TUBE CLEANERS

See Cleaners, Tube

TUBE FINNING MACHINES

See Machines, Tube Finning

TUBES, BOILER

Babcock & Wilcox Co., The, Tubular Products Div., Alliance, O.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Globe Steel Tubes Co., Milwaukee, Wis.
H & H Tube & Mfg. Co., Detroit, Mich.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis. (stainless)
Wolverine Tube Div. of Calumet and Hecla, Inc., Detroit, Mich.

TUBES, CONDENSER

American Brass Co., Waterbury, Conn.
Babcock & Wilcox Co., The, Tubular Products Div., Alliance, O.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bethlehem Steel Co., Bethlehem, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Bundy Tubing Co., Detroit, Mich.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Chase Brass & Copper Co., Waterbury, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Globe Steel Tubes Co., Milwaukee, Wis.
Helical Tube Corp., Grand Rapids, Mich.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Revere Copper and Brass Incorporated, New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Sawhill Tubular Products, Inc., Sharon, Pa.
Scovill Mfg. Co., Waterville Div., Waterville, Conn. (copper base)
Standard Tube Co., Detroit, Mich.
Timken Roller Bearing Co., Canton, O.
Trent Tube Co., East Troy, Wis. (stainless)
Wolverine Tube Div. of Calumet & Hecla, Inc., Detroit, Mich.

York Corp., York, Pa.

TUBES, PITOT

Defender Instrument and Regulator Co., St. Louis, Mo.
Dwyer Mfg. Co., F. W., Chicago, Ill.
Ellison Draft Gage Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Hill & Co., E. Vernon, Lake Geneva, Wis.
Illinois Testing Laboratories, Inc., Chicago, Ill.
Meriam Instrument Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trimount Instrument Co., Chicago, Ill.

TUBING, ALUMINUM

Aluminum Co. of America, Pittsburgh, Pa.
American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Colonial Alloys Co., Metals Div., Philadelphia, Pa.
H & H Tube & Mfg. Co., Detroit, Mich.
Harvey Aluminum, Torrance, Calif.
Kaiser Aluminum & Chemical Corp., Oakland, Calif.
Penn Brass & Copper Co., Erie, Pa.
Revere Copper and Brass Incorporated, New York, N. Y.
Reynolds Metals Co., Louisville, Ky.
Sawhill Tubular Products, Inc., Sharon, Pa.
United Wire & Supply Corp., Cranston, R. I.
Wolverine Tube Div. of Calumet & Hecla, Inc., Detroit, Mich.
Youngstown Welding & Engineering, Youngstown, O.

TUBING BENDERS

See Benders, Tubing

TUBING, BRASS AND COPPER

American Brass Co., Waterbury, Conn. (copper/steel admiralty/steel)
Bridgeport Brass Co., Bridgeport, Conn.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Colonial Alloys Co., Metals Div., Philadelphia, Pa.
Everhot Products Co., Chicago, Ill.
Gardiner Metal Co., Chicago, Ill.
H & H Tube & Mfg. Co., Detroit, Mich.
Helical Tube Corp., Grand Rapids, Mich.
Hussey & Co., C. G., Div. Copper Range Co., Pittsburgh, Pa.
Keeney Mfg. Co., Newington, Conn. (Chrome plated)
Kensico Tube Co., Mt. Kisco, N. Y.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Mueller Brass Co., Port Huron, Mich.
Penn Brass & Copper Co., Erie, Pa.
Phelps Dodge Copper Products Corp., British American Tube Div., New York, N. Y.
Reading Tube Corp., New York, N. Y.
Revere Copper and Brass Incorporated, New York, N. Y.
Roberts Tube Works, Detroit, Mich.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J. (K-L-M)
United Wire & Supply Corp., Cranston, R. I.
Wolverine Tube Div. of Calumet and Hecla, Inc., Detroit, Mich.

TUBING, BRONZE

American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Chase Brass & Copper Co., Waterbury, Conn.
Colonial Alloys Co., Metals Div., Philadelphia.
Helical Tube Corp., Grand Rapids, Mich.
Lewin-Mathes Co., Lewin Metals Div., St. Louis, Mo.
Revere Copper and Brass, Incorporated, New York, N. Y.

TUBING, CAPILLARY

American Brass Co., Waterbury, Conn.
Kensico Tube Co., Mt. Kisco, N. Y.
Kenmore Machine Products, Inc., Lyons, N. Y.
Revere Copper & Brass, Incorporated, New York.
Sawhill Tubular Products, Inc., Sharon, Pa.
Superior Tube Co., Norristown, Pa.
Techniflex Corp., Port Jervis, N. Y.
Wabash Corp., Chicago, Ill.
Wolverine Tube Div. of Calumet & Hecla, Inc., Detroit, Mich.

TUBING CUTTERS

See Cutters, Tubing

TUBING, DUPLEX

American Brass Co., Waterbury, Conn.
Bridgeport Brass Co., Bridgeport, Conn.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O. (Steel and copper)

TUBING, FABRIC, FLEXIBLE

Arrowhead Rubber Co., Long Beach, Calif.
Flexible Tubing Corp., Guilford, Conn.
Johns-Manville, New York, N. Y.

TUBING, FINNED

Aerofin Corp., Syracuse, N. Y.
American Coils Co., Newark, N. J.
Autorad, Inc., Chicago, Ill.
Brown Fintube Co., The, Elyria, O.
Bush Mfg. Co., West Hartford, Conn.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
G. & O. Mfg. Co., New Haven, Conn.
Griscom-Russell Co., The, Massillon, O.
Heatron, Inc., York, Pa.
Heat-X Inc., Brewster, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Industrial Mfg. & Engineering Co., Chicago.
Kramer Trenton Co., Trenton, N. J.
Kritzer Radiant Coils, Inc., Chicago, Ill.
McCord Corp., Detroit, Mich.
Merchant & Evans Co., Philadelphia, Pa.
Peerless of America, Inc., Chicago, Ill.
Quaid Fabrications, Inc., Philadelphia, Pa.
Refrigeration Economics Co., Inc., Canton, O.
Rempe Co., Chicago, Ill.
Rome-Turney Radiator Co., Rome, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Tenney Engineering, Inc., Union, N. J.
Thermek Sales Co., Whitewater, Wis. (spined)
Vapor Heating Corp., Chicago, Ill.
Wolverine Tube Div. of Calumet and Hecla, Inc., Detroit, Mich. (Aluminum, copper)

TUBING, MAGNESIUM

Dow Chemical Co., The, Midland, Mich.

TUBING, METAL, FLEXIBLE

Aeroquip Corp., Jackson, Mich.
American Metal Hose Branch, American Brass Co., The, Waterbury, Conn.
Atlantic Metal Hose Co., Inc., New York.
DK Mfg. Co., Cobra Metal Hose Div., Chicago, Ill.
Flexonics Corp., Maywood, Ill.
International Metal Hose Co., Detroit, Mich.
Johnson Metal Hose, Inc., Waterbury, Conn.
Marquette Coppersmithing Co., Philadelphia.
National Lead Co., New York, N. Y.
Packless Metal Hose, Inc., New Rochelle, N. Y.
Titeflex, Inc., Newark, N. J.
Universal Metal Hose Co., Chicago, Ill.

TUBING, NICKEL AND NICKEL ALLOY

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Bridgeport Brass Co., Bridgeport, Conn.
Bundy Tubing Co., Detroit, Mich.
Chase Brass & Copper Co., Waterbury, Conn.
Electric Steel Foundry Co., Portland, Ore.
Globe Steel Tubes Co., Milwaukee, Wis.
Helical Tube Corp., Grand Rapids, Mich.
International Nickel Co., Inc., The, New York, N. Y.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pittsburgh Steel Co., Pittsburgh, Pa.
Revere Copper and Brass, Incorporated, New York, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Trent Tube Co., East Troy, Wis.
Wolverine Tube Div. of Calumet and Hecla, Inc., Detroit, Mich.

Youngstown Welding & Engineering, Youngstown, O.

TUBING, PLASTIC

Acadia Synthetic Products Div., Western Felt Works, Chicago, Ill.
Alpha Plastics, Inc., W. Orange, N. J. (PVC)
American Agile Corp., Bedford, O.
American Hard Rubber Co., New York, N. Y.
Anesite Co., Chicago, Ill. (polyethylene, butyrate)
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass. (PVC)
Carlon Products Corp., Cleveland, O.
Commercial Plastics Co., Chicago, Ill.
Continental Can Co., Millsplastic Pipe Div., New York, N. Y.
Continental-Diamond Fibre Co., Newark, Del.
Crane Co., Chicago, Ill.
Crescent Plastics, Inc., Evansville, Ind. (flexible)
Extruded Plastics, Inc., Norwalk, Conn.
Flexible Tubing Corp., Guilford, Conn.
Flexrock Co., Philadelphia, Pa.
Gates Rubber Co., The, Denver, Colo.
General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass.
Goodrich Co., B. F., Akron, O.
Goodyear Tire & Rubber Co., Akron, O.
Hamilton Rubber Mfg. Corp., Trenton, N. J.
Hartwell & Son, Inc., H. N., Boston, Mass.
Haveg Corp., Newark, Del.
Hudson Industries, Inc., Detroit, Mich.
Imperial Brass Mfg. Co., Chicago, Ill. (polyethylene)
Irvington Varnish and Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Manufacturers Corp., Mansfield, O.
National Tube Div., United States Steel Corp., Pittsburgh, Pa. (polyethylene flexible)
Pacific States Felt & Mfg. Co., Inc., San Francisco, Calif. (fibre and bakelite)
Panelyte Div., St. Regis Paper Co., New York, N. Y.
Reflin Co., Gardena, Calif.
Resistoflex Corp., Belleville, N. J.
Richland Co., Mansfield, O.
Sandee Mfg. Co., Chicago, Ill.
Saran Lined Pipe Co., Ferndale, Mich.
Skyline Industries, Titusville, Pa.
Superior Tube Co., Norristown, Pa.
Triangle Conduit & Cable Co., Inc., New Brunswick, N. J.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York.
United States Stoneware Co., Plastics & Synthetics Div., Akron, O.
Vanton Pump & Equipment Corp., New York, N. Y. (vinyl-Polethylene)
Yardley Plastics Co., Columbus, O.

TUBING, SILVER CLAD AND SILVER ALLOY

Baker & Co., Inc., Newark, N. J.
General Plate Div., Metals & Controls Corp., Attleboro, Mass.

TUBING, STEEL, ALLOY, SEAMLESS

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Globe Steel Tubes Co., Milwaukee, Wis.
H & H Tube & Mfg. Co., Detroit, Mich.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Pittsburgh Steel Co., Pittsburgh, Pa.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Superior Tube Co., Norristown, Pa.
Timken Roller Bearing Co., Canton, O.
Trent Tube Co., East Troy, Wis.
Tube Reducing Corp., Wallington, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

TUBING, STEEL, ALLOY, WELDED

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Duraloy Co., Scottdale, Pa.
H & H Tube & Mfg. Co., Detroit, Mich.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Laclede Steel Co., St. Louis, Mo.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Standard Tube Co., Detroit, Mich.
Trent Tube Co., East Troy, Wis.
Youngstown Sheet & Tube Co., Youngstown, O.
Youngstown Welding & Engineering, Youngstown, O.

TUBING, STEEL, BRAZED

Bundy Tubing Co., Detroit, Mich.
Rochester Products, Div. of General Motors Rochester, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.

TUBING, STEEL, SEAMLESS

Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Central Steel & Wire Co., Chicago, Ill.
Everhot Products Co., Chicago, Ill.
Globe Steel Tubes Co, Milwaukee, Wis.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Pittsburgh Steel Co., Pittsburgh, Pa.
Republic Steel Corp., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Superior Tube Co., Norristown, Pa.
Timken Roller Bearing Co., Canton, O.
Trent Tube Co., East Troy, Wis.
Tube Reducing Corp., Wallington, N. J.
Youngstown Sheet & Tube Co., Youngstown, O.

TUBING, STEEL, STAINLESS

Allegheny Ludlum Steel Corp., Pittsburgh, Pa.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Central Steel & Wire Co., Chicago, Ill.
Chase Brass & Copper Co., Waterbury, Conn.
Crucible Steel Co. of America, Pittsburgh, Pa.
Electric Steel Foundry Co., Portland, Ore.
Globe Steel Tubes Co., Milwaukee, Wis.
Helical Tube Corp., Grand Rapids, Mich.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Pacific Tube Co., Los Angeles, Calif.
Pypon Co., Pittsburgh, Pa.
Republic Steel Corp, Steel & Tubes Div., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Standard Tube Co., Detroit, Mich.
Superior Tube Co., Norristown, Pa.
Timken Roller Bearing Co., Canton, O.
Trent Tube Co., East Troy, Wis.
Tube Reducing Corp., Wallington, N. J.
Youngstown Welding & Engrg., Youngstown, O.

TUBING, STEEL, WELDED

American Pipe & Steel Corp., Alhambra, Calif.
Armco Steel Corp., Middletown, O.
Avon Tube Div., Higbe Mfg. Co., Rochester, Mich.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Babcock & Wilcox Tube Co., The, Tubular Products Div., Alliance, O.
Bundy Tubing Co., Detroit, Mich.
Central Steel & Wire Co., Chicago, Ill.
Chicago Metal Mfg. Co., Chicago, Ill.
Everhot Products Co., Chicago, Ill.
Globe Steel Tubes Co., Milwaukee, Wis.
Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Laclede Steel Co., St. Louis, Mo.
National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Nikoh Tube Co., Chicago, Ill.
Pacific Tube Co., Los Angeles, Calif.
Pittsburgh Tube Co., Pittsburgh, Pa.
Republic Steel Corp, Steel & Tubes Div., Cleveland, O.
Revere Copper and Brass, Incorporated, New York, N. Y.
Rochester Products Div., Rochester, N. Y.
Sawhill Tubular Products, Inc., Sharon, Pa.
Sharon Steel Corp., Sharon, Pa.
South Chester Tube Co., Chester, Pa.
Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
Standard Tube Co., Detroit, Mich.
Thermapanels, Inc., Santa Clara, Calif.
Trent Tube Co., East Troy, Wis.
Wheatland Tube Co., Philadelphia, Pa.
Wolverine Tube Div. of Calumet & Hecla, Inc., Detroit, Mich.
Youngstown Sheet & Tube Co., Youngstown, O.
Youngstown Welding & Engineering, Youngstown, O.

TUBING, TITANIUM

Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Sawhill Tubular Products, Inc., Sharon, Pa.
Superior Tube Co., Norristown, Pa.
Trent Tube Co., East Troy, Wis.
Tube Reducing Corp., Wallington, N. J.
Youngstown Welding & Engineering, Youngstown, O.

TUBING, ZINC

Matthiessen & Hegeler Zinc Co., La Salle, Ill.

TUBING, ZIRCONIUM

Sawhill Tubular Products, Inc., Sharon, Pa.
Superior Tube Co., Norristown, Pa.
Tube Reducing Corp., Wallington, N. J.
Youngstown Welding & Engineering, Youngstown, O.

TURBINES, MECHANICAL DRIVE

Carling Turbine Blower Co., Worcester, Mass.
Coffin Co., J. S., Jr., Englewood, N. J.
Coppus Engineering Corp., Worcester, Mass.
Dean Hill Pump Co., Indianapolis, Ind.
De Laval Steam Turbine Co., Trenton, N. J.
Elliott Co., Jeannette, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Multi-Vent Div., Pyle-National Co., Chicago.
Murray Iron Wks. Co., Burlington, Ia.
Pyle-National Co., The, Chicago, Ill.
Solar Aircraft Co., San Diego, Calif.
Steam Turbine Div., Worthington Corp., Wellesville, N. J.
Terry Steam Turbine Co., Hartford, Conn.
Westinghouse Electric Corp., Pittsburgh, Pa.
Whiton Machine Co., New London, Conn.
Wing Mfg. Co., L. J., Linden, N. J.

2, 3 AND 4-WAY VALVES

See Valves, 2, 3 and 4-way

ULTRASONIC DUST AND FUME COLLECTION

See Collection, Dust and Fume, Utrasonic

ULTRAVIOLET LAMPS

See Lamps, Sterilizing for Duct Installation; Units, Sterilizing, Air

UNDERGROUND PIPING

See Conduit, Underground Piping

UNDERWATER HEATERS

See Heaters, Steam Jet, for Liquids

UNIONS, BRASS

Acheson Mfg. Co., Rankin, Pa.
Chase Brass & Copper Co., Waterbury, Conn.
Commonwealth Brass Corp., Detroit, Mich.
Crane Co., Chicago, Ill.
Flagg & Co., Inc., Stanley G., Philadelphia.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Imperial Brass Mfg. Co., Chicago, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
King Union Co., Inc., Hillsgrove, R. I.
Leavitt Machine Co., Orange, Mass.
Moran Flexible Joint Co., Louisville, Ky.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Phoenix Brass Fittings Corp., Irvington, N. J.
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Rhode Island Fittings Co., Providence, R. I.

Union Metal Works, Chelsea, Mass.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.
Weatherhead Co., The, Cleveland, O.

UNIONS, INSULATING

See Joints, Pipe, Electrical Insulating

UNIONS, MALLEABLE, BRASS SEAT

Beaton & Corbin Mfg. Co., Southington, Conn.
Corley Co., Inc., The, Jersey City, N. J.
Crane Co., Chicago, Ill.
Dart Union Co., Providence, R. I.
Das Div. of The Zeller Corp., Defiance, O.
Detroit Brass & Malleable Co., Detroit, Mich.
Fairbanks Co., The, New York, N. Y.
Flagg & Co., Inc., Stanley G., Philadelphia, Pa.
General Fittings Co., Providence, R. I.
Grabler Mfg. Co., Cleveland, O.
Grinnell Co., Inc., Providence, R. I.
Illinois Malleable Iron Co., Chicago, Ill.
Jefferson Union Co., Inc., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
King Union Co., Inc., Hillsgrove, R. I.
Malleable Iron Fittings Co., Branford, Conn.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Rhode Island Fittings Co., Providence, R. I.
Rockwood Sprinkler Co., Worcester, Mass.
Stockham Valves & Fittings, Birmingham, Ala.
Union Malleable Mfg. Co., Ashland, O.
Walworth Co., New York, N. Y.
Ward Foundries, Inc., J. P., Blossburgh, Pa.

UNIONS, ORIFICE

Catawissa Valve & Fittings Co., Catawissa, Pa.
Foxboro Co., Foxboro, Mass.
Ladish Co., Cudahy, Wis.
Midwest Piping Co., Inc., St. Louis, Mo.
Taylor Forge & Pipe Wks., Chicago, Ill.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

UNIONS, STEEL

Capitol Mfg. & Supply Co., Columbus, O.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Champion Machine & Forging Co., Cleveland, O.
Chiksan Co., Brea, Calif.
Crane Co., Chicago, Ill.
Dart Union Co., Providence, R. I.
Das Div. of The Zeller Corp., Defiance, O.
Fairbanks Co., The, New York, N. Y.
Frick Co., Waynesboro, Pa.
Gilbert Brass Foundry Co., St. Louis, Mo.
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (Stainless steel and alloy only)
Henry Valve Co., Melrose Park, Ill.
Keystone Tool Corp., Houston, Tex.
Rockwood Sprinkler Co., Worcester, Mass.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.

UNIT COOLERS

See Coolers, Unit

UNIT HEATERS

See Heaters, Unit

UNIT VENTILATORS

See Ventilators, Unit

UNITS, AIR CONDITIONING, FOR AUTOMOBILES

A.R.A. Mfg. Co., Ft. Worth, Texas
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Forston Co., Houston, Texas
Frigidaire Div., General Motors Corp., Dayton, O.
Frigikar Corp., Dallas, Tex.
Harrison Radiator Div., General Motors, Lockport, N. Y.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kool-Kar Co., Inc., Detroit, Mich.
Norris-Thermador Corp., Los Angeles, Calif.
Wabash Corp., Chicago, Ill.

UNITS, AIR CONDITIONING, BUS, TRUCK AND TRAILER

A.R.A. Mfg. Co., Ft. Worth, Texas.
Carrier Corp., Syracuse, N. Y.
Ellis & Watts Products, Inc., Cincinnati, O.
Frigikar Corp., Dallas, Tex.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Keco Industries, Inc., Cincinnati, O.
McGraw Electric Co., Clark Div., Chicago, Ill.
Metal Products Eng., Inc., Los Angeles, Calif.
Trane Co., The, La Crosse, Wis.
U. S. Thermo Control Co., Minneapolis, Minn.
Waukesha Motor Co., Waukesha, Wis.

UNITS, AIR CONDITIONING, CENTRAL STATION TYPE

Self contained blower, heating and/or cooling coil, filter, humidifier unit for remote location and duct air distribution

Addison Products Co., Addison, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Holland, O.
Alco Refrigeration Sales & Service, Inc., Cleveland, O.
Alton Mfg. Co., Dallas, Tex.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
American Thermal Industries, Inc., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Anetsberger Bros., Inc., Northbrook, Ill.
Armstrong Furnace Co., Columbus, O.
Bahnson Co., Winston-Salem, N. C.
Bakeraire Corp., South Windham, Me.
Bal-Air, Inc., Nashville, Tenn.
Bishop & Babcock Mfg. Co., Cleveland, O.
Blazer, M., & Son, Passaic, N. J.
Brunner Mfg. Co., Utica, N. Y.
Bryant Heater Div., Affiliated Gas Equipment Co. Inc., Cleveland, O.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Carrier Corp., Syracuse, N. Y.
Central States Mfg. Co., Inc., Arkansas City, Kan.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Cool-Ette, Inc., Detroit, Mich.
Clarage Fan Co., Kalamazoo, Mich.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St Louis, Mo.
Deering Air Conditioning Co., The, Cincinnati, O.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Inc., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Gibson Refrigerator Co., Greenville, Mich.
Governair Corp., Oklahoma City, Okla.
Hastings Air Conditioning Co., Hastings, Neb.
Howe Ice Machine Co., Chicago, Ill.
Iron Fireman Mfg. Co., Cleveland, O.
Jaden Mfg. Co., Hastings, Neb.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kennard Corp., St. Louis, Mo.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lennox Furnace Co., Columbus, O.
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Meyer Furnace Co., The, Peoria, Ill.
Midwest Air Conditioning Co., Des Moines, Ia.
Niagara Blower Co., New York, N. Y.
Palmer Mfg. Corp., Phoenix, Ariz.
Parks-Cramer Co., Fitchburg, Mass.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Schnacke, Inc., Evansville, Ind.
Servel, Inc., Evansville, Ind. (absorption type)
Silco Products, Inc., Minneapolis, Minn.
Sterling Air Conditioning Corp., Gastonia, N. C.
Surface Combustion Corp., Toledo, O.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Ultrasonic Corp., Cambridge, Mass.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Williamson Heater Co., Cincinnati, O.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, EXCLUSIVELY FOR HOSPITAL OPERATING ROOMS, WITH EXPLOSIONPROOF MOTOR

Trane Co., The, La Crosse, Wis.

UNITS, AIR CONDITIONING, HORIZONTAL PACKAGE TYPE

Self contained blower, cooling and/or heating coil, filter, humidifier unit for ceiling or platform location in space conditioned, for connection to remote compressor or cold water supply, and steam or hot water

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Holland, O.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Thermal Industries, Inc., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Bahnson Co., Winston-Salem, N. C.
Bakeraire Corp., South Windham, Me.
Bal-Air, Inc., Nashville, Tenn.
Besser Metal Products Corp., Charlotte, N. C.
Blazer, M., & Son, Passaic, N. J.
Brown Products Co., Forest Hills, N. Y.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clarage Fan Co., Kalamazoo, Mich.
Clime-Matic Corp., South Norwalk, Conn.
Conditionaire Unit Co., Chicago, Ill.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Inc., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Governair Corp., Oklahoma City, Okla.
Hastings Air Conditioning Co., Hastings, Neb.
Iron Fireman Mfg. Co., Cleveland, O.
Jaden Mfg. Co., Hastings, Neb.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kennard Corp., St. Louis, Mo.
King Co., The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Marlo Coil Co., St. Louis, Mo.
McIntyre Engineering Co., Inc., South San Francisco, Calif.
McQuay, Inc., Minneapolis, Minn.
Midwest Air Conditioning Co., Des Moines, Ia.
Mueller Climatrol, Milwaukee, Wis.

Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Refrigeration Appliances Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Super-Cold Corp., Los Angeles, Calif.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Vilter Mfg. Co., Milwaukee, Wis.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, INDUSTRIAL TYPE

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Holland, O.
American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
American Thermal Industries, Inc., Detroit, Mich.
Anetsberger Bros., Inc., Northbrook, Ill.
Armstrong Furnace Co., Columbus, O.
Bakeraire Corp., South Windham, Me.
Bal-Air, Inc., Nashville, Tenn.
Bishop & Babock Mfg. Co., Cleveland, O.
Blazer, M., & Son, Passiac, N. J.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carbide & Carbon Chemicals Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clarage Fan Co., Kalamazoo, Mich.
Clime-Matic Corp., South Norwalk, Conn.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Drayer-Hanson, Inc., Los Angeles, Calif.
Drying Systems, Inc., Chicago, Ill.
Economy Equipment Co., Chicago, Ill.
Frick Co., Waynesboro, Pa.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
Governair Corp., Oklahoma City, Okla.
Haertel Co., Walter, Minneapolis, Minn.
Howe Ice Machine Co., Chicago, Ill.
Industrial Mfg. & Engineering Co., Chicago, Ill.
Jaden Mfg. Co., Hastings, Neb.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kennard Corp., St. Louis, Mo.
King Co., The, Owatonna, Minn.
Kramer Trenton Co., Trenton, N. J.
Larkin Coils, Inc., Atlanta, Ga.
Lintern Corp., Painesville, O.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Midwest Air Conditioning Co., Des Moines, Ia.
New York Blower Co., Chicago, Ill. (Make-up air units)
Niagara Blower Co., New York, N. Y.
Parks-Cramer Co., Fitchburg, Mass.
Pfening Co., Fred D., Columbus, O.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Refrigeration Engineering, Inc., Los Angeles, Calif.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rempe Co., Chicago, Ill.
Rigidbilt Inc., Chicago, Ill.
Rinehart Inc., Richmond, Ind.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., St. Louis, Mo.
Silco Products, Inc., Minneapolis, Minn.
Simplaire, New York, N. Y.
Somers, Inc., H. J., Detroit, Mich.
Super-Cold Corp., Los Angeles, Calif.
Surface Combustion Corp., Toledo, O.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Vilter Mfg. Co., Milwaukee, Wis.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, REVERSE REFRIGERATION CYCLE

Acme Industries, Inc., Jackson, Mich.
American Coils Co., Newark, N. J.
Brunner Mfg. Co., Utica, N. Y.
Fedders-Quigan Corp., Buffalo, N. Y.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
Muncie Gear Works, Inc., Muncie, Ind.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
York Corp., York, Pa.

UNITS, AIR CONDITIONING, SUMMER, EVAPORATIVE COOLING TYPE

For cooling by evaporation, no dehumidification

Air-Cooling Engineering Co., Evanston, Ill.
Air Equipment Co., Denver, Colo.
Air & Refrigeration Corp., New York, N. Y.
Alton Mfg. Co., Dallas, Tex.
American Blower Corp., Detroit, Mich.
American Cooling Tower Co., Kansas City, Mo.
American Moistening Co., Providence, R. I.
Auburn Foundry, Inc., Stoker Div., Auburn, Ind.
Austin Engineering & Mfg. Co., Inc., Ysleta (El Paso County), Texas
Bahnson Co., Winston-Salem, N. C.
Barwick Mfg. Corp., Wichita, Kan.
Buensod-Stacey, Inc., New York, N. Y.
Campbell Co., E. K., Kansas City, Mo.
Carrier Corp., Syracuse, N. Y.
Central States Mfg. Co., Inc., Arkansas City, Kan.
Climax Machinery Co., Indianapolis, Ind.
Comfort Products Corp., Dallas, Tex.
Dearborn Stove Co., Dallas, Tex.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Inc., Los Angeles, Calif.
Essick Mfg. Co., Los Angeles, Calif.
Farr Co., Los Angeles, Calif.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Heating Assurance, Inc., Spokane, Wash.
International Metal Products Co., Phoenix, Ariz.
Kool-Sleep, Inc., Cambridge, O.
Lennox Furnace Co., Columbus, O.
Little Giant Vaporizer Co., Inc., Oklahoma City, Okla. (vaporizers and pumps for evaporative coolers)
Martin Fan & Blower Co., Chicago, Ill.
Mefco Mfg. Co., Air Conditioning Div., Glendale, Calif.
Montag Stove & Furnace Works, Portland, Ore.
Morey, Dan, Los Angeles, Calif. (aspen fiber replacement mats)
Mountain States Equipment Co., Denver, Colo.
National Engineering & Mfg. Co., Sedalia, Mo.
National Gas Equipment Co., Inc., Denison, Tex.
Norris-Thermador Corp., Los Angeles, Calif.
Palmer Mfg. Co., Phoenix, Ariz.
Polaire Cooler Co., Inc., Phoenix, Ariz.
Rheem Mfg. Co., New York, N. Y.
Rhode Island Humidifier & Ventilating Co., Boston, Mass.
Thermador Electrical Mfg., Los Angeles, Calif.
Trade Wind Motorfans, Inc., Rivera, Calif.
United Electric Service Co., Wichita Falls, Tex.
Utility Appliance Corp., Los Angeles, Calif.
Western Blower Co., Seattle, Wash.
Wright Mfg. Co., Phoenix, Ariz.
X L Refrigerating Co., Chicago, Ill.

UNITS, AIR CONDITIONING, SUMMER, ROOM TYPE, FLOOR CABINET, REMOTE COMPRESSOR OR COLD WATER, UNDER 3 TONS CAPACITY

Self contained blower, coil, filter unit for connection to remote compressor or cold water supply

Air Conditioning Engineering Co., Cambridge, Mass.
Airtron Corp., Holland, O.
Bal-Air, Inc., Nashville, Tenn.
Blazer, M. & Son, Passaic, N. J.
Borg-Warner Corp., Hydraline Products Div., Detroit, Mich.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Delta Heating Corp., Trenton, N. J.
Drayer-Hanson, Inc., Los Angeles, Calif.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Air Conditioning Dept., Bloomfield, N. J.
Hastings Air Conditioning Co., Hastings, Neb.
International Mfg. Co., Oklahoma City, Okla.
Jaden Mfg. Co., Hastings, Neb.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kennard Corp., St. Louis, Mo.
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Mueller Climatrol, Milwaukee, Wis.
Nat Corp., Kansas City, Mo.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Rinehart Inc., Richmond, Ind.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Williamson Heater Co., Cincinnati, O.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
Young Radiator Co., Racine, Wis.

UNITS, AIR CONDITIONING, SUMMER, ROOM TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR, UNDER 3 HP

Self contained blower, coil, compressor, filter unit

Air Conditioning Engineering Co., Cambridge, Mass.
Airtron Corp., Holland, O.
Ajax Corp. of America, Evansville, Ind.
Armstrong Furnace Co., Columbus, O.
Automatic Firing Corp., St. Louis, Mo.
Bakeraire Refrigeration Corp., South Windham, Me.
Bal-Air, Inc., Nashville, Tenn.
Brunner Mfg. Co., Utica, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Cool-Ette, Inc., Detroit, Mich.
Crosley Div., Avco Mfg. Corp., Cincinnati, O.
Delta Heating Corp., Trenton, N. J.
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Fedders-Quigan Corp., Buffalo, N. Y.
Hotpoint Co., Chicago, Ill.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Jordon Refrigerator Co., Inc., Philadelphia, Pa.
Marlo Coil Co., St. Louis, Mo.

Mueller Climatrol, Milwaukee, Wis.
Nat Corp., Kansas City, Mo.
Philco Corp., Philadelphia, Pa.
Primor Products, Inc., Adrian, Mich.
RCA Victor Div., Radio Corp. of America, Camden, N. J.
Rinehart, Inc., Richmond, Ind.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Schnacke, Inc., Evansville, Ind.
Servel, Inc., Evansville, Ind.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Surface Combustion Corp., Toledo, O.
Sutton Corp., O. A., The, Wichita, Kan.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Williamson Heater Co., Cincinnati, O.
York Corp., York, Pa.

UNITS, AIR CONDITIONING, SUMMER, STORE TYPE, FLOOR CABINET, SELF CONTAINED COMPRESSOR, 3 HP AND OVER

Self contained blower, coil, compressor, filter unit with air discharge approximately 6 ft above floor

Airtron Corp., Holland, O.
American Coil Co., Newark, N. J.
American Thermal Industries, Inc., Detroit, Mich.
Anchor Div., Stratton & Terstegge Co., Inc., New Albany, Ind.
Armstrong Furnace Co., Columbus, O.
Automatic Firing Corp., St. Louis, Mo.
Bakeraire Corp., South Windham, Me.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Bonair Products, Inc., Colwyn, Pa.
Brunner Mfg. Co., Utica, N. Y.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clime-Matic Corp., South Norwalk, Conn.
Cool-Ette, Inc., Detroit, Mich.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Delta Heating Corp., Trenton, N. J.
Frick Co., Waynesboro, Pa.
Frigid, Inc., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Air Conditioning Div., Bloomfield, N. J.
Gibson Refrigerator Co., Greenville, Mich.
Governair Corp., Oklahoma City, Okla.
Iron Fireman Mfg. Co., Cleveland, O.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Koch Refrigerators, Inc., North Kansas City, Mo.
Midwest Air Conditioning Co., Des Moines, Ia.
Mueller Climatrol, Milwaukee, Wis.
Nat Corp., Kansas City, Mo.
Primor Products, Inc., Adrian, Mich.
Quiet-Heet Mfg. Corp., Newark, N. J.
Rinehart, Inc., Richmond, Ind.
Servel, Inc., Evansville, Ind. (absorption type)
Sterling Air Conditioning Corp., Gastonia, N. C.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Surface Combustion Corp., Toledo, O.
Trane Co., The, LaCrosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Union Asbestos & Rubber Co., Chicago, Ill.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Williams Div., Eureka Williams Co., Div. of Henney Motors Co., Inc., Bloomington, Ill.
Williamson Heater Co., Cincinnati, O.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.
York-Shipley, Inc., York, Pa.

UNITS, AIR CONDITIONING, WINDOW, FOR CASEMENT WINDOWS

American Motors Corp., Nash Kelvinator Corp., Detroit, Mich.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O. (with provision for heating)
Deering Air Conditioning Co., The, Cincinnati, O.
Frigidaire Div., General Motors Corp., Dayton, O.
Quiet-Heet Mfg. Corp., Newark, N. J. (heating optional)
Universal Major Electric Appliances, Inc., Lima, O.
United States Radiator Corp., Detroit, Mich.
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass.

UNITS, AIR CONDITIONING, WINDOW, FOR DOUBLE-HUNG WINDOWS

Addison Products Co., Addison, Mich.
Admiral Corp., Chicago, Ill.
Air Conditioning Engineering Co., Cambridge, Mass.
Amana Refrigeration, Inc., Amana, Ia.
American Motors Corp., Nash Kelvinator Corp., Detroit, Mich. (some heating elements)
Automatic Firing Corp., St. Louis, Mo.
Bakeraire Corp., South Windham, Me.
Bard Mfg. Co., Bryan, O.
Blissfield Mfg. Co., Blissfield, Mich.
Burnam Corp., Irvington, N. Y.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Cauhorn Distributing Co., Detroit, Mich.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O. (with provision for heating)
Coolerator Co., Duluth, Minn.
Crowell & Dunn, Inc., New York, N. Y.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Dayton Pump & Mfg. Co., Dayton, O.
Dearborn Stove Co., Dallas, Tex.
Deering Air Conditioning Co., The, Cincinnati, O. (for casement windows)
Emerson Electric Mfg. Co., The, St. Louis, Mo.
Emerson Radio and Phonograph Co., New York, N. Y.
Fedders-Quigan Corp., Buffalo, N. Y.
Forston Co., Houston, Texas
Fresh'nd-Aire Company, Div. of Cory Corp., Chicago, Ill.
Friedrich Refrigerators, Inc., San Antonio, Tex.
Frigid, Inc., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton, O.
General Electric Co., Major Appliance Div., Louisville, Ky.
Gibson Refrigerator Co., Greenville, Mich.
Hotpoint Co., Chicago, Ill.
Hunter Fan and Ventilating Co., Inc., Memphis, Tenn.
Iron Fireman Mfg. Co., Cleveland, O.
Jordan Refrigerator Co., Inc., Philadelphia.
Kauffman Air Conditioning Corp., St. Louis, Mo.
King Refrigerator Co., Glendale, N. Y.
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Lombard Mfg. Co., Youngstown, O.
Magic Chef, Inc., St. Louis, Mo.
Mitchell Mfg. Co., Chicago, Ill.
Motor Products Corp., Deepfreeze Appliance Div., North Chicago, Ill. (some models have heating element)
Mueller Climatrol, Milwaukee, Wis.
National Engineering & Mfg. Co., Sedalia, Mo.
National Steel Construction Co., Logansport, Ind.
Noma Lites, Inc., New York, N. Y.
Norge Heat Div., Borg-Warner Corp., Kalamazoo, Mich.
Olympic Radio & Television, Inc., Long Island City, N. Y.
Payne Furnace Div., Affiliated Gas Equipment Inc., Monrovia, Calif.
Perfection Stove Co., Cleveland, O.
Philco Corp., Philadelphia, Pa.
Pleasantaire Corp., Washington, D. C.
Quiet-Heet Mfg. Corp., Newark, N. J. (heating optional)
Radio Corp. of America, RCA Victor Div., Camden, N. J.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Robbins & Myers, Inc., Fan Div., Memphis, Tenn.
Rheem Mfg. Co., Chicago, Ill.
Servel, Inc., Evansville, Ind.
Sterling Air Conditioning Corp., Gastonia, N. C.
Sub-Zero Freezer Co., Inc., Madison, Wis.
Sutton Corp., O. A., The, Wichita, Kan.
Tele King Corp., New York, N. Y.
Tywel Mfg. Corp., Brooklyn, N. Y.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Universal Major Electric Appliances, Inc., Lima, O.
Victor Products Corp., Hagerstown, Md.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Electric Appliance Div., East Springfield, Mass. (with or without heating element)
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

UNITS, AIR CONDITIONING, WINTER, ROOM TYPE, FLOOR CABINET

Self contained blower, filter, heating coil, humidifier unit

Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Aladdin Heating Corp., Oakland, Calif.
Auburn Burner Co., Auburn, Ind.
Bakeraire Corp., South Windham, Me.
Bryant Industrial Div., Affiliated Gas Equipment Co., Inc., Cleveland, O.
Buffalo Forge Co., Buffalo, N. Y.
Campbell Heating Co., Des Moines, Ia.
Clarage Fan Co., Kalamazoo, Mich.
Dalzen Mfg. Co., St. Clair, Mich.
Drayer-Hanson, Inc., Los Angeles, Calif.
Johnson Co., S. T., Bridgeport, Pa.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kehm Corp., The, Chicago, Ill.
Kennard Corp., St. Louis, Mo.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Refrigeration Economics Co., Inc., Canton, O.
Reznor Mfg. Co., Mercer, Pa.
Somers, Inc., H. J., Detroit, Mich.
Surface Combustion Corp., Toledo, O.
Trane Co., The, La Crosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
York Corp, York, Pa.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET

Self contained blower, cooling and heating coil, filter, humidifier unit for connection to remote compressor or cold water supply, and steam or hot water supply

Acme Industries, Inc., Jackson, Mich.
Air Conditioning Engineering Co., Cambridge, Mass.
Air & Refrigeration Corp., New York, N. Y.
Airtron Corp., Holland, O.
American Coils Co., Newark, N. J.
American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Auburn Burner Co., Auburn, Ind.
Bakeraire Corp., South Windham, Me.
Bal-Air, Inc., Nashville, Tenn.
Barkow Mfg. Co., Inc., Aug. G., Milwaukee, Wis.
Borg-Warner Corp., Hydraline Products Div., Detroit, Mich.
Brown Products Co., Forest Hills, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Bush Mfg. Co., West Hartford, Conn.
Carrier Corp., Syracuse, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., Dayton, O.
Clarage Fan Co., Kalamazoo, Mich.

Clime-Matic Corp., South Norwalk, Conn.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., St. Louis, Mo.
Drayer-Hanson, Inc., Los Angeles, Calif.
Dunham Co., Chicago, Ill.
Frigidaire Div., General Motors Corp., Dayton, O.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Hastings Air Conditioning Co., Hastings, Neb.
International Mfg. Co., Oklahoma City, Okla.
Iron Fireman Mfg. Co., Cleveland, O.
Jaden Mfg. Co., Hastings, Neb.
Johnson Co., S. T., Bridgeport, Pa.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Kennard Corp., St. Louis, Mo.
Koch Refrigerators, Inc., North Kansas City, Mo.
Kramer Trenton Co., Trenton, N. J.
Lipman Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Marlo Coil Co., St. Louis, Mo.
McQuay, Inc., Minneapolis, Minn.
Modine Mfg. Co., Racine, Wis.
Nat Corp., Kansas City, Mo.
Niagara Blower Co., New York, N. Y.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Refrigeration Appliances, Inc., Chicago, Ill.
Refrigeration Economics Co., Inc., Canton, O.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Rittling Corp., The, Buffalo, N. Y.
Servel, Inc., Evansville, Ind.
Trane Co., The, La Crosse, Wis.
Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
United States Air Conditioning Corp., Minneapolis, Minn.
United States Radiator Corp., Detroit, Mich.
Viking Mfg. Corp., Cleveland, O.
Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Worthington Corp., Harrison, N. J.
York Corp., York, Pa.

UNITS, AIR CONDITIONING, YEAR AROUND, ROOM TYPE, FLOOR CABINET, INDUCTION

Self-Contained Cooling and Heating Coil, Filter, Etc. for Connection to High Pressure Primary Air Supply, Cold Water Supply, and Hot Water Supply

Carrier Corp., Syracuse, N. Y.
Deering Air Conditioning Co., The, Cincinnati, O.
York Corp., York, Pa.

UNITS, CONDENSATE DISPOSAL, FOR AIR CONDITIONING

See Pumps, Condensate, For Removing Condensation from Air Conditioning Units

UNITS, FUEL OIL, HEATING, PUMPING AND STRAINING

Ace Engineering Co., Chicago, Ill.
Alstrom Corp., New York, N. Y.
Barclay, Inc., Robert, Chicago, Ill.
Byron Jackson Co., Los Angeles, Calif.
Coen Co., San Francisco, Calif.
Condenser Service & Engineering Co., Inc., Hoboken, N. J.
Davis Engineering Corp., Elizabeth, N. J.
Drying Systems, Inc., Chicago, Ill.
Duo-Therm Div., Motor Wheel Corp., Lansing, Mich.
Eagan Co., Inc., Walter H., Philadelphia, Pa.
Engineer Co., New York, N. Y.
Faber Engineer Co., Philadelphia, Pa.
Foster Pump Wks., Inc., Brooklyn, N. Y.
Graham Mfg. Co., Inc., New York, N. Y.
Hauck Mfg. Co., Brooklyn, N. Y.
Iron Fireman Mfg. Co., Cleveland, O.
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y.
Leahy Mfg. Co., Los Angeles, Calif.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Peabody Engineering Corp., New York, N. Y.
Petro, Cleveland, O.
Ray Oil Burner Co., San Francisco, Calif.
Staples & Pfeiffer, San Francisco, Calif.
Todd Shipyards Corp., Combustion Equipment Div., Elmhurst, L. I., N. Y.
Tuthill Pump Co., Chicago, Ill.
Warner Lewis Co., Div. of Fram Corp., Tulsa, Okla.
Webster Electric Co., Racine, Wis.
Wilson Engineering Corp., Chicago, Ill.

UNITS, HEAT RECOVERY, AIR-TO-AIR

Air Conditioning Engineering Co., Cambridge, Mass.
Heatube Corp., Allegan, Mich.
Therm-o-Wheel, Inc., Far Rockaway, N. Y.

UNITS, STERILIZING, AIR

Cooper Hewitt Electric Co., Hoboken, N. J.
Germatrol Corp., Pittsburgh, Pa.
Hanovia Chemical & Mfg. Co., Newark, N. J.
Health Trola Div., Excel Heating & Air Conditioning Co., Chicago, Ill.
Hydrocol-Air-Sanitation, Inc., New York, N. Y.
Iron City Chemical Co., Valencia, Pa.
Lientz Co., B. P., Kansas City, Mo.
National Air Conditioning, Inc., Johnstown, Pa.
Pittsburgh Chemical Laboratories, Inc., Pittsburgh, Pa.
Sampson Chemical & Pigment Corp., Chicago, Ill.

UNITS, WINDOW VENTILATOR AND FILTER

Airgard Mfg. Co., Chicago, Ill.
Berns Mfg. Co., Chicago, Ill.
Frigid, Inc., Brooklyn, N. Y.
Goettl Bros. Metal Prod., Inc., Phoenix, Ariz.
Health Trola Div., Excel Heating & Air Conditioning Co., Chicago.
Ilg Electric Ventilating Co., Chicago, Ill.
Kaiser Co., H. S., Chicago, Ill.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Palmer Mfg. Corp., Phoenix, Ariz.
Reed Unit-Fans, Inc., New Orleans, La.
Reliable Metal Engineering Co., Chicago, Ill.
Schwitzer-Cummins Co., Indianapolis, Ind.
Somers Inc., H. J., Detroit, Mich.
Standard Electric Mfg. Co., West Berlin, N. J.
Utility Appliance Corp., Los Angeles, Calif.

UNIVERSAL JOINTS

See Joints, Universal, for Operating Valves

VACUUM CLEANERS FOR BOILERS

See Cleaners, Vacuum, for Boilers

VACUUM CLEANING SYSTEMS, FITTINGS FOR

See Fittings for Central Vacuum Cleaning Systems

VACUUM GAGES

See Gages, Indicating, Vacuum

VACUUM HEATING SYSTEMS

See Systems, Heating, Vacuum

VACUUM PUMPS

See Pumps, Vacuum

VACUUM RECORDERS

See Recorders, Pressure and Vacuum

VALVE OPERATORS

See Operators, Valve

VALVE RESEATERS

See Reseaters, Valve

VALVES, AIR OPERATING

A-P Controls Corp., Milwaukee, Wis.
American Moistening Co., Providence, R. I.
Atlas Valve Co., Newark, N. J.
Automatic Switch Co, Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Barksdale Valves, Los Angeles, Calif.
Bellows Co., The, Akron, O.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Central Brass Mfg. Co., Cleveland, O.
Clark Controller Co., Cleveland, O.
Conoflow Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
De Zurik Shower Co., Sartell, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electric Sprayit Div., Thomas Industries, Inc., Sheboygan, Wis.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Flexible Valve Corp., Palisades Park, N. Y.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gotham Instrument Co., Div., American Machine & Metals, Inc., New York, N. Y.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt & Son, Inc., C. B., Salem, O.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Regulator Co., Cincinnati, O.
Keckley Co., O. C., Chicago, Ill.
Keller Tool Co., Grand Haven, Mich.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Ledeen Mfg. Co., Los Angeles, Calif.
Leslie Co., Lyndhurst, N. J.
Lunkenheimer Co., Cincinnati, O.
McAlear Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Norwalk Valve Co., South Norwalk, Conn.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco.
Vernon Tool Co., Ltd., Alhambra, Calif.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Inc., New Orleans, La.
Weston Electrical Instrument Corp., Newark, N. J.
Wilson Engineering Corp., Chicago, Ill.

VALVES, ANGLE

Alloy Steel Products Co., Linden, N. J. (Stainless steel)
American Car & Foundry Co., New York, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Belknap Mfg. Co., Bridgeport, Conn.
Bordo Co., Inc., L. J., Glenside, Pa. (Plug)
Carpenter Valve Corp., The, Cleveland, O.
Central Brass Mfg. Co., Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Cla-Val Co., Alhambra, Calif.
Cleveland Brass Mfg. Co., The, Cleveland, O.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Detroit Brass & Malleable Co., Detroit, Mich.
De Zurik Shower Co., Sartell, Minn.
Duriron Co., The, Dayton, O. (acid resisting)
Edward Valves, Inc., East Chicago, Ind.
Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (porcelain)
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)

Haveg Corp., Newark, Del. (plastic and plastic body)
Henry Valve Co., Melrose Park, Ill.
Hills-McCanna Co., Chicago, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Leslie Co., Lyndhurst, N. J.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard Rubber)
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marine & Industrial Products Co., Philadelphia, Pa.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
McAlear Mfg. Co., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Nason Co., Clarkston, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Powell Co., Wm., Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Valley Foundry & Machine Works, Inc., Fresno, Calif.
Vanton Pump & Equipment Corp., New York, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Youngstown Welding & Engineering, Youngstown, O.

VALVES, AUTOMATIC SHUTOFF WITH MANUAL RESET

A-P Controls Corp., Milwaukee, Wis.
Automatic Switch Co., Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Cla-Val Co., Alhambra, Calif.
Cooper Co., Clark, Palmyra, N. J.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fisher Governor Co., Marshalltown, Ia.
Flexible Valve Corp., Palisades Park, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
McRae Corp., Glendale, Calif.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Norwalk Valve, South Norwalk, Conn.
P-K Industries, Inc., North Arlington, N. J.
Roylyn, Inc., Glendale, Calif.
Samet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Sullivan Valve & Engineering Co., Butte, Mont.
Thermac Co., Los Angeles, Calif.
Valco, Inc., Cincinnati, O.
Vernon Tool Co., Ltd., Alhambra, Calif.

VALVES, BACK PRESSURE

Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Valve Mfg. Corp., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Cla-Val Co., Alhambra, Calif.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Fischer Governor Co., Mashalltown, Ia.
Hammel-Dahl Co., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
Illinois Engrg. Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Regulator Co., Cincinnati, O.
Keckley Co., O. C., Chicago, Ill.
Klipfel Valves, Inc., Hamilton, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
Norwalk Valve Co., South Norwalk, Conn.
Pokorney Mfg. Co., Chicago, Ill.
Spence Engineering Co., Inc., Walden, N. Y.

VALVES, BALANCING, FOR FORCED HOT WATER HEATING SYSTEMS

Bell & Gossett Co., Morton Grove, Ill.
Detroit Controls Corp., Detroit, Mich.
Farris Engineering Corp., Palisades Park, N. J.
G & H Mfg. Co., Philadelphia, Pa.
General Heaters & Regulators Co., East Chicago, Ind.
Hammond Brass Works, Hammond, Ind.
Hi-Flow Products, Inc., Lindenhurst, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
J O Mfg. Co., South Gate, Calif.
Maid-O'-Mist, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Ohio Brass Co., Mansfield, O.
Quality Specialty Co., Inc., Camden, N. J.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
T & H Engineering Co., Little Ferry, N. J.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
Welsbach Corp., The, Kitson Div., Philadelphia, Pa.

VALVES, BALL TYPE

Lunkenheimer Co., Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Rockwood Sprinkler Co., Worcester, Mass.
Smith Co., S. Morgan, York, Pa.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, BAR STOCK

Carpenter Valve Mfg. Co., Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Conoflow Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Greer Hydraulics, Inc., Brooklyn, N. Y.
Grove Valve and Regulator Co., Oakland, Calif.
Guardian Products Corp., Michigan City, Ind.
Hammel-Dahl Co., Providence, R. I.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockford Sprinkler Co., Worcester, Mass.
Star Stainless Screw Co., Paterson, N. J.
Trerice Co., H. O., Detroit, Mich.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Cleveland, O.

VALVES, BLOW-OFF

Barrett Machine Co., Pittsburgh, Pa.
Bordo Co., Inc., L. J., Glenside, Pa.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Crane Co., Chicago, Ill.
Edward Valves, Inc., East Chicago, Ind.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Jenkins Bros., New York, N. Y.
Kaye & MacDonald, Inc., West Orange, N. J.
Keckley Co., O. C., Chicago, Ill.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Madden Corp., The, Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marine & Industrial Products Co., Philadelphia, Pa.
McDonnell & Miller, Inc., Chicago, Ill.
New York Air Valve Corp., Brooklyn, N. Y.
Norgren Co., C. A., Englewood, Colo.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Schade Valve Mfg. Co., Philadelphia, Pa.
Strong, Carlisle & Hammond Co., Cleveland, O.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Wilson Engineering Corp., Chicago, Ill.
Yarnall-Waring Co., Philadelphia, Pa.

VALVES, BOILER, NON-RETURN

Crane Co., Chicago, Ill.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Golden Anderson Valve Specialty Co., Pittsburgh, Pa.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Lunkenheimer Co., Cincinnati, O.
McAlear Mfg. Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.

VALVES, BRAZED END

Fairbanks Co., The, New York, N. Y.
Jenkins Bros., New York, N. Y.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Walworth Co., New York, N. Y.

VALVES, BUTTERFLY

Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fabri-Valve Co. of America, Portland, Ore.
Fisher Govenor Co., Marshalltown, Ia.
Foxboro Co., Foxboro, Mass.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (chemical stoneware)
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)

Hauck Mfg. Co., Brooklyn, N. Y.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Keystone Tool Corp., Houston, Tex.
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
North American Mfg. Co., Cleveland, O.
Norwalk Valve Co., South Norwalk, Conn.
Powell Co., Wm., The, Cincinnati, O.
Rockwell Co., W. S., Fairfield, Conn.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Smith Co., S. Morgan, York, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Whittaker Co., Wm. R., Los Angeles, Calif.

VALVES, BYPASS, WITH PROVISIONS FOR SOME CIRCULATION WHEN CLOSED

Jenkins Bros., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Ohio Brass Co., Mansfield, O.
Powell Co., Wm., The, Cincinnati, O.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Stockham Valves & Fittings Co., Birmingham, Ala.
Superior Valve & Fittings Co., Pittsburgh, Pa.

VALVES, CHECK

A-P Controls Corp., Milwaukee, Wis.
Alloy Steel Products Co., Linden, N. J. (stainless steel)
American Car & Foundry Co., New York, N. Y.
American Hard Rubber Co., New York, N. Y. (Rubber lined)
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Amp Corp., St. Louis, Mo.
Associated Valve & Engineering Corp., Chicago, Ill.
Barrett, Haentjens & Co., Hazelton, Pa.
Belknap Mfg. Co., Bridgeport, Conn.
Cameron Iron Works, Inc., Houston, Tex.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Cla-Val Co., Alhambra, Calif.
Clow & Sons, James B., Chicago, Ill.
Cochrane Corp., Philadelphia, Pa.
Cooper Alloy Corp., Hillside, N. J.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Detroit Brass & Malleable Co., Detroit, Mich.
Durabla Mfg. Co., New York, N. Y.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fairbanks Co., The, New York, N. Y.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Frick Co., Waynesboro, Pa.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (chemical stoneware & porcelain)
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Greer Hydraulics, Inc., Brooklyn, N. Y.
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hammond Brass Works, Hammond, Ind.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)
Henry Valve Co., Melrose Park, Ill.
Hersey Mfg. Co., South Boston, Mass.
Hold-Tite Valve Mfg. Co., New York, N. Y.
Imperial Brass Mfg. Co., Chicago, Ill.
Jacuzzi Bros., Inc., Richmond, Calif.
James-Pond-Clark, Pasadena, Calif.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Keystone Tool Corp., Houston, Tex.
Knights Co., James, Sandwich, Ill.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead lined)
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Mansfield & Green, Cleveland, O.
McRae Corp., Glendale, Calif.
Miller Valve Co., Inc., Pittsburgh, Pa. (Silent)
Milwaukee Valve Co., Milwaukee, Wis.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Norgren Co., C. A., Englewood, Colo.
Northern Indiana Brass Co., Elkhart, Ind.
Norwalk Valve Co., South Norwalk, Conn.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Phillips & Co., H. A., Chicago, Ill.
Pittsburgh Valve Co., Reedsville, W. Va.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Pokorney Mfg. Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
Preferred Utilities Mfg. Corp., New York, N. Y.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rensselaer Valve Co., Cohoes, N. Y.
Research Vacuum Supply Co., Chicago, Ill.
Rockwell Co., W. S., Fairfield, Conn.
Roylyn, Inc., Glendale, Calif.
Ruggles-Klingemann Mfg. Co., Boston, Mass. (Bleeder type)
Saran Lined Pipe Co., Ferndale, Mich. (Saran Lined)
Schaible Co., The, Cincinnati, O.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Sealed Unit Parts Co., Inc., Bronx, N. Y.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Sims Pump Valve Co., Hoboken, N. J.
Smith Co., S. Morgan, York, Pa.
Smolensky Valve Co., Inc., Bedford, O.
Star Stainless Screw Co., Paterson, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Stokes Molded Products, Trenton, N. J. (Hard rubber)
Strong, Carlisle & Hammond Co., Cleveland, O.
Superior Valve and Fittings Co., Pittsburgh, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Universal Valve Co., Elizabeth, N. J.
Vanton Pump & Equipment Corp., New York, N. Y.
Vernon Tool Co., Ltd., Alhambra, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
White Flomatic Corp., Hoosick Falls, N. Y.
Whittaker Co., Wm. R., Los Angeles, Calif.
Williams Gauge Co., Inc., The, Pittsburgh, Pa. (Noiseless)
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, COMPRESSOR

Bakeraire Corp., South Windham, Me.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Detroit Stamping Co., Detroit, Mich.
Durabla Mfg. Co., New York, N. Y.
Electric Sprayit Div., Thomas Industries, Inc., Sheboygan, Wis.
Farris Engineering Corp., Palisades Park, N. J.
Frick Co., Waynesboro, Pa.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Mueller Brass Co., Port Huron, Mich.
OPW Corp., Cincinnati, O.
Ohio Injector Co., Wadsworth, O.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Schaible Co., The, Cincinnati, O.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Vilter Mfg. Co., The, Milwaukee, Wis.
Voss Co., J. H. H., Inc., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, CYLINDER OPERATED

Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N J.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Clow & Sons, James B., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Everlasting Valve Co., Jersey City, N. J.
Fischer & Porter Co., Hatboro, Pa.
Foxboro Co., Foxboro, Mass.
Hammel-Dahl Co., Providence, R. I.
Hunt & Son, Inc., C. B., Salem, O.
Okadee Co., Chicago, Ill.
P-K Industries, Inc., North Arlington, N. J.
Powell Co., Wm., The, Cincinnati, O.
Smith Co., S. Morgan, York, Pa.

VALVES, DIAPHRAGM

(Diaphragm controller elements controls opening of valve)

A-P Controls Corp., Milwaukee, Wis.
American Hard Rubber Co., New York, N. Y.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Automatic Switch Co., Orange, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Dahl, G. W., Bristol, R. I.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Engineering Corp., Palisades Park, N. J.
Fischer & Porter Co., Hatboro, Pa.
Fisher Governor Co., Marshalltown, Ia.
Flexible Valve Corp., Palisades Park, N. J.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Golden-Anderson Valve Spec. Co., Pittsburgh, Pa.
Hasco Valve & Machine Co., Milwaukee, Wis.
Hills-McCanna Co., Chicago, Ill.
Hubbell Corp., Mundelein, Ill.
Johnson Service Co., Milwaukee, Wis.
Keckley Co., O. C., Chicago, Ill.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Marine & Industrial Products Co., Philadelphia, Pa.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
Mueller Steam Specialty Co., Long Island City, N. Y.
North American Mfg. Co., Cleveland, O.
P-K Industries, Inc., North Arlington, N. J.
Parks-Cramer Co., Fitchburg, Mass.
Penn Controls, Inc., Goshen, Ind.
Powers Regulator Co., Skokie, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Saran Lined Pipe Co., Ferndale, Mich.
Sarco Co., Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Squires Co., C. E., The, Cleveland, O.
Swartwout Co., The, Cleveland, O.
Trerice Co., H. O., Detroit, Mich.
United States Rubber Co., New York, N. Y.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., Newark, N. J.

VALVES, DIAPHRAGM (Diaphragm itself throttles or shuts off flow)

A-P Controls Corp., Milwaukee, Wis.
American Hard Rubber Co., New York, N. Y.
Associated Valve & Engineering Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Bristol Co., The, Waterbury, Conn.
Dahl, G. W., Bristol, R. I.
Flexible Valve Corp., Palisades Park, N. Y.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (chemical stoneware)
General Controls Co., Glendale, Calif.
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hills-McCanna Co., Chicago, Ill.
Hunt & Son, Inc., C. B., Salem, O.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Keckley Co., O. C., Chicago, Ill.
Lead Lined Iron Pipe Co., Wakefield, Mass.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mueller Steam Specialty Co., Long Island City, N. Y.
Norwalk Valve Co., South Norwalk, Conn.
Penn Industrial Instrument Corp., Philadelphia, Pa.
Saran Lined Pipe Co., Ferndale, Mich.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scientific Instrument Co., Detroit, Mich.
Trerice Co., H. O., Detroit, Mich.
United States Rubber Co., New York, N. Y.
Warren Engineering Co., Broadway, N. J.
Weston Electrical Instrument Corp., Newark, N. J.
White-Rodgers Electric Co., St. Louis, Mo.

VALVES, DIAPHRAGM (Diaphragm used as seal between body and bonnet)

American Hard Rubber Co., New York, N. Y.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cla-Val Co., Alhambra, California.
Conoflow Corp., Dept. P, Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Duriron Co., Inc., The, Dayton, O.
Flexible Valve Corp., Palisades Park, N. Y.
General Controls Co., Glendale, Calif.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Co., Providence, R. I.
Haveg Corp., Newark, Del.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
McRae Corp., Glendale, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Norwalk Valve Co., South Norwalk, Conn.
Research Vacuum Supply Co., Chicago, Ill.
Taylor Instrument Companies, Rochester, N. Y.
Trane Co., The, La Crosse, Wis.
United States Rubber Co., New York, N. Y.
Weston Electrical Instrument Corp., Newark, N. J.

VALVES, FIRE PROTECTION, SPRINKLER SYSTEM CONTROL

Allen Mfg. Co., W. D., Chicago, Ill.
Blaw Knox Co., Power Piping & Sprinkler Div., Pittsburgh, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Davis Regulator Co., Chicago, Ill.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Grinnell Co., Inc., Providence, R. I.
Grove Valve and Regulator Co., Oakland, Calif.
Hersey Mfg. Co., South Boston, Mass.
Hodgman Mfg. Co., Inc., Taunton, Mass.
Jenkins Bros., New York, N. Y.
Kenedy Valve Mfg. Co., The, Elmira, N. Y.
McRae Corp., Glendale, Calif.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Raisler Corp., Grimes Sprinkler Div., New York, N. Y.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwood Sprinkler Co., Worcester, Mass.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Controls Co., Inc., Los Angeles, Calif.
Valco, Inc., Cincinnati, O.
Vernon Tool Co., Ltd., Alhambra, Calif.

VALVES, FLOAT

A-P Controls Corp., Milwaukee, Wis. (Oil)
Aerotec Corp., The, Greenwich, Conn.
Alco Valve Co., St. Louis, Mo.
American Hard Rubber Co., New York, N. Y. (Hard rubber)
American Moistening Co., Providence, R. I.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Beckett & Co., Inc., Thomas, Dallas, Tex.
Boylston Steam Specialty Co., Chicago, Ill.
Caldwell Co., W. E., Louisville, Ky.
Central Brass Mfg. Co., Cleveland, O.
Cla-Val Co., Alhambra, Calif.
Cleveland Humidifier Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Detroit Controls Corp., Detroit, Mich.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Frick Co., Waynesboro, Pa.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Keckley Co., O. C., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Locke Regulator Co., Salem, Mass.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
Maid-O'-Mist, Inc., Chicago, Ill.
Marine & Industrial Products Co., Philadelphia, Pa.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Monash-Younker Co., Chicago, Ill.
Morey, Dan, Los Angeles, Calif.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Perfex Corp., Milwaukee, Wis.
Phillips & Co., H. A., Chicago, Ill.
Robert Mfg. Co., Los Angeles, Calif.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Shade Valve Mfg. Co., Philadelphia, Pa.
Schaub Engineering Co., Fred H., Chicago, Ill.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scoville Mfg. Co., Waterville Div., Waterville, Conn.
Smith Co., S. Morgan, York, Pa.
Spence Engineering Co., Inc., Walden, N. Y.
Stickle Steam Specialties Co., Indianapolis, Ind.
Taco Heaters, Inc., Cranston, R. I.
TOT Towers, Inc., Houston, Tex.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.

VALVES, FLOW CONTROL, FOR HOT WATER HEATING SYSTEMS

Barber-Colman Co., Rockford, Ill.
Bell & Gossett Co., Morton Grove, Ill.
Dunham Co., C. A., Chicago, Ill.
Fischer & Porter Co., Hatboro, Pa.
General Controls Co., Glendale, Calif., and Skokie, Ill.
General Heaters & Regulators Co., East Chicago, Ind.
Hammel-Dahl Co., Providence, R. I.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Kainer & Co., Chicago, Ill.
Kates Co., W. A., Deerfield, Ill.
Kehm Corp., The, Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Quality Specialty Co., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Webster & Co., Warren, Camden, N. J.
White Flomatic Corp., Hoosick Falls, N. Y.

VALVES, FORGED STEEL

American Meter Co., Inc., Philadelphia, Pa.
Catawissa Valves & Fittings Co., Catawissa, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Grove Valve and Regulator Co., Oakland, Calif.
Henry Valve Co., Melrose Park, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marine & Industrial Products Co., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penberthy Injector Co., Detroit, Mich.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Schutte & Koerting Co., Philadelphia, Pa.
Smith Co., S. Morgan, York, Pa.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Vogt Machine Co., Henry, Louisville, Ky.

VALVES, GATE, ALLOY

Alloy Steel Products Co., Linden, N. J.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Edward Valves, Inc., East Chicago, Ind.
Electric Steel Foundry Co., Portland, Ore.
Fabri-Valve Co. of America, Portland, Ore.
Fischer & Porter Co., Hatboro, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hasco Valve & Machine Co., Milwaukee, Wis.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Whittaker Co., Wm. R., Los Angeles, Calif.
Youngstown Welding & Engineering, Youngstown, O.

VALVES, GATE, ALUMINUM

Darling Valve & Mfg. Co., Williamsport, Pa.

Hasco Valve & Machine Co., Milwaukee, Wis.
OPW Corp., Cincinnati, O.
Powell Co., Wm., The, Cincinnati, O.
Whittaker Co., William R., Los Angeles, Calif.
Youngstown Welding & Engineering, Youngstown, O.

VALVES, GATE, BRASS AND BRONZE

American Brass Co., Waterbury, Conn.
Belknap Mfg. Co., Bridgeport, Conn.
Bordo Co., Inc., L. J., Glenside, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Clow & Sons, James B., Chicago, Ill.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Darling Valve Mfg. Co., Williamsport, Pa.
Detroit Brass & Malleable Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Hammond Brass Wks., Hammond, Ind.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Tin lined)
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Milwaukee Valve Co., Milwaukee, Wis.
Moran Flexible Joint Co., Louisville, Ky. (Distillery)
Morrison Brothers Co., Dubuque, Ia.
Northern Indiana Brass Co., Elkhart, Ind.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rensselaer Valve Co., Cohoes, N. Y.
Schaible Co., The, Cincinnati, O.
Scott Valve Mfg. Co., Detroit, Mich.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, GATE, IRON BODY

Bordo Co., Inc., L. J., Glenside, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead and tin lined)
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Mueller Co., Decatur, Ill.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rensselaer Valve Co., Cohoes, N. Y.
Scott Valve Mfg. Co., Detroit, Mich.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Stockham Valves & Fittings, Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Whittaker Co., Wm. R., Los Angeles, Calif.

VALVES, GATE, MALLEABLE IRON

Bordo Co., Inc., L. J., Glenside, Pa.
Crane Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.

VALVES, GATE, STEEL

Allegheny Valve Co., Warren, Pa.
Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Bordo Co., Inc., L. J., Glenside, Pa.
Cameron Iron Works, Inc., Houston, Tex.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Edward Valves, Inc., East Chicago, Ind.
Everlasting Valve Co., Jersey City, N. J.
Fabri-Valve Co. of America, Portland, Ore.
Grove Valve and Regulator Co., Oakland, Calif.
Hamer Valves, Inc., Long Beach, Calif.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lead Lined Iron Pipe Co., Wakefield, Mass. (lead lined)
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Ohio Injector Co., Wadsworth, O.
Okadee Co., Chicago, Ill.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Stockham Valves & Fittings Co., Birmingham, Ala.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Youngstown Welding & Engineering, Youngstown, O.

VALVES, GLOBE, ALLOY

Alloy Steel Products Co., Linden, N. J.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Carpenter Valve Corp., The, Cleveland, O.
Cooper Alloy Corp., Hillside, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Electric Steel Foundry Co., Portland, Ore.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville,, Tenn.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Marine & Industrial Products Co., Philadelphia, Pa.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
Strahman Valves, Inc., New York, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Youngstown Welding & Engineering, Youngstown, O.

VALVES, GLOBE, ALUMINUM

Dahl, G. W., Bristol, R. I.
Hasco Valve & Machine Co., Milwaukee.
Powell Co., Wm., The, Cincinnati, O.
Youngstown Welding & Engineering, Youngstown, O.

VALVES, GLOBE, BRASS AND BRONZE

American Brass Co., Waterbury, Conn.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Belknap Mfg. Co., Bridgeport, Conn.
Bowser, Inc., Fort Wayne, Ind.
California Brass Mfg. Co., Los Angeles.
Carpenter Valve Corp., The, Cleveland, O.
Central Brass Mfg. Co., Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Cleveland Brass Mfg. Co., The, Cleveland, O.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Detroit Brass & Malleable Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
Fairbanks Co., The, New York, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Wks., Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Morse-Smith-Morse, Inc., Watertown, Mass.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
OPW Corp., Cincinnati, O.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Schaible Co., The, Cincinnati, O.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco.
Walworth Co., New York, N. Y.
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, GLOBE, IRON BODY

Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Fairbanks Co., The, New York, N. Y.
Frick Co., Waynesboro, Pa.
Grinnell Co., Inc., Providence, R. I.
Hammel-Dahl Co., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Lunkenheimer Co., Cincinnati, O.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Nason Co., Clarkston, Mich.
Ohio Injector Co., Wadsworth, O.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Stockham Valves & Fittings, Birmingham, Ala.
Strahman Valves, Inc., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Walworth Co., New York, N. Y.

VALVES, GLOBE, MALLEABLE IRON

Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Powell Co., Wm., The, Cincinnati, O.
Walworth Co., New York, N. Y.

VALVES, GLOBE, STEEL

Allmetal Screw Products Co., Inc., Garden City, Long Island, N. Y.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.

Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
De Zurik Shower Co., Sartell, Minn.
Edward Valves, Inc., East Chicago, Ind.
Fabri-Valve Co. of America, Portland, Ore.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Co., Industrial Div., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Strahman Valves, Inc., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Velan Engineering Co., Havertown, Pa.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Youngstown Welding & Engineering, Youngstown, O.

VALVES, INSTRUMENT

Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Bristol Co., The, Waterbury, Conn.
Dahl, G. W., Bristol, R. I.
Edward Valves, Inc., East Chicago, Ind.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
Hills-McCanna Co., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Keckley Co., O. C., Chicago, Ill.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Penberthy Injector Co., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Trerice Co., H. O., Detroit, Mich.
Warren Engineering Co., Broadway, N. J.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., Newark, N. J.

VALVES, LINED

American Hard Rubber Co., New York, N. Y. (Rubber lined)
Automatic Switch Co., Orange, N. J.
Cla-Val Co., Alhambra, Calif.
Conoflow Corp., Philadelphia, Pa.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Division Lead Co., Summit, Ill.
Fabri-Valve Co. of America, Portland, Ore.
Flexible Valve Corp., Palisades Park, N. Y.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Goodrich Co., B. F., Akron, O. (Rubber lined)
Grinnell Co., Inc., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis. (Rubber)
Hills-McCanna Co., Chicago, Ill.
Lead Lined Iron Pipe Co., Wakefield, Mass. (Lead lined)
National Lead Co., New York, N. Y. (Lead)
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Raybestos-Manhattan, Inc., Passaic, N. J. (Rubber)
Resisto Pipe & Valve Co., East Cambridge, Mass. (Lead)
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Saran Lined Pipe Co., Ferndale, Mich. (Saran lined)
Smith Co., S. Morgan, York, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
United States Rubber Co., New York, N. Y.
United States Stoneware Co., New York, N. Y.

VALVES, MIXING, HOT AND COLD WATER

Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Bell & Gossett Co., Morton Grove, Ill.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Dole Valve Co., The, Chicago, Ill.
Foxboro Co., Foxboro, Mass.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Fittings Co., Providence, R. I.
Hammel-Dahl Co., Providence, R. I.
Holby Valve Co., New York, N. Y.
Leonard Valve Co., Cranston, R. I.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
Strahman Valves, Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Watts Regulator Co., Lawrenceville, Mass.
Webster & Co., Warren, Camden, N. J.
Yula Water Heaters Inc., New York, N. Y.

VALVES, MIXING, HOT AND COLD WATER, THERMOSTATIC

Jordan Regulator Corp., Cincinnati, O.
Lawler Automatic Controls, Inc., Mt. Vernon, N. Y.
Leonard Valve Co., Cranston, R. I.
Powers Regulating Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Taco Heaters, Inc., Cranston, R. I.
Warren Engineering Co., Broadway, N. J.

VALVES, MIXING, STEAM AND WATER

Central Brass Mfg. Co., Cleveland, O.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hammel-Dahl Co., Providence, R. I.
Johnson Service Co., Milwaukee, Wis.
Leonard Valve Co., Cranston, R. I.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Strahman Valves, Inc., New York, N. Y.
Taylor Instrument Companies, Rochester, N. Y.
Vapor Heating Corp., Chicago, Ill.

VALVES, MOTOR OPERATED

Associated Valve & Engineering Co., Chicago, Ill.
Au-Temp-Co Corp., New York, N. Y.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Bailey Co., Chas. M., San Francisco, Calif.
Barber-Colman Co., Rockford, Ill.
Barksdale Valves, Los Angeles, Calif.
Belco Industrial Equipment Div., Inc., Paterson, N. J.
Bell & Gossett Co., Morton Grove, Ill.
Bristol Co., The, Waterbury, Conn.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Clow & Sons, James B., Chicago, Ill.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Cutler-Hammer, Inc., Milwaukee, Wis.
Darling Valve & Mfg. Co., Williamsport, Pa.
Davis Regulator Co., Chicago, Ill.
De Zurik Shower Co., Sartell, Minn.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Eclipse Fuel Engineering Co., Rockford, Ill.
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Fischer & Porter Co., Hatboro, Pa.
Foster Engineering Co., Union, N. J.
Foxboro Co., Foxboro, Mass.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Heat Timer Corp., New York, N. Y.
Hills-McCanna Co., Chicago, Ill.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Keckley Co., O. C., Chicago, Ill.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Mason-Neilan Regulator Co., Boston, Mass.
Mercoid Corp., Chicago, Ill.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
North American Mfg. Co., Cleveland, O.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penn Controls, Inc., Goshen, Ind.
Philadelphia Gear Works, Inc., Philadelphia, Pa.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rensselaer Valve Co., Cohoes, N. Y.
Rockwell Co., W. S., Fairfield, Conn.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Smith Co., S. Morgan, York, Pa.
Squires Co., C. E., The, Cleveland, O.
Stockham Valves & Fittings, Birmingham, Ala.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vogt Machine Co., Henry, Louisville, Ky.
Walworth Co., New York, N. Y.
Webster & Co., Warren, Camden, N. J.
Wedgeplug Valve Co., Inc., New Orleans, La.
Weston Electrical Instrument Corp., Newark, N. J.
Whittaker Co., Wm. R., Los Angeles, Calif.

VALVES, NEEDLE

A-P Controls Corp., Milwaukee, Wis. (Oil)
Allin Mfg. Co., Inc., Chicago, Ill.
Alloy Steel Products Co., Linden, N. J. (Stainless steel)
American Meter Co., Inc., Philadelphia, Pa.
Associated Valve & Engineering Co., Chicago, Ill.
Automatic Switch Co., Orange, N. J.
Carpenter Valve Corp., The, Cleveland, O. (Stainless steel stem, brass bar stock body)
Central Brass Mfg. Co., Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.

Cooper Alloy Corp., Hillside, N. J.
Cooper Co., Clark, Palmyra, N. J.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Detroit Brass & Malleable Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
Edward Valves, Inc., East Chicago, Ind.
Fairbanks Co., The, New York, N. Y.
Fisher Governor Co., Marshalltown, Ia.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lancaster Heat Transfer Co., Inc., Brooklyn, N. Y.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Lunkenheimer Co., Cincinnati, O.
Maid-O'-Mist, Inc., Chicago, Ill.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marsh Instrument Co., Skokie, Ill.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Modern Engineering Co., St. Louis, Mo.
Morrison Brothers Co., Dubuque, Ia.
Norgren Co., C. A., Englewood, Colo.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Research Vacuum Supply Co., Chicago, Ill.
Schaible Co., The, Cincinnati, O.
Star Stainless Screw Co., Paterson, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Superior Controls Co., Inc., Los Angeles, Calif.
Taylor Instrument Companies, Rochester, N. Y.
Torit Mfg. Co., St. Paul, Minn.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Cleveland, O.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, OXYGEN

Fairbanks Co., The, New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Hunt & Son, Inc., C. B., Salem, O.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Modern Engineering Co., St. Louis, Mo.
Ohio Injector Co., Wadsworth, O.
Oxygen Equipment & Service Co., Chicago, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Stockham Valves & Fittings Co., Birmingham, Ala.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Valco, Inc., Cincinnati, O.
Walworth Co., New York, N. Y.

VALVES, PLASTIC

American Agile Corp., Bedford, O.
Atlas Mineral Products Co., Mertztown, Pa.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Hartwell & Son, Inc., H. N., Boston, Mass.
Haveg Corp., Newark, Del.
Hills-McCanna Co., Chicago, Ill.
Roylyn, Inc., Glendale, Calif.
Saran Lined Pipe Co., Ferndale, Mich.
Vanton Pump & Equipment Corp., New York, N. Y.
Wilmington Plastics, Inc., Wilmington, Del.

VALVES, PLUG

American Car & Foundry Co., New York, N. Y.
Andale Co., Philadelphia, Pa.
Ardee Mfg. Co., Inc., Los Angeles, Calif.
Barrett, Haentjens & Co., Hazleton, Pa.
Barrett Machine Co., Pittsburgh, Pa.
Bordo Co., Inc., L. J., Glenside, Pa.
Cameron Iron Works, Inc., Houston, Tex.
Carpenter Valve Corp., The, Cleveland, O.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Clow & Sons, James B., Chicago, Ill.
Cooper Alloy Corp., Hillside, N. J.
Cooper Co., Clark, Palmyra, N. J.
Corning Glass Works, Corning, N. Y.
Couplings Co., Chicago, Ill.
Crane Co., Chicago, Ill.
De Zurik Shower Co., Sartell, Minn. (rubber faced)
Duriron Co., Inc., Dayton, O. (Acid resisting)
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Faber Engineering Co., Inc., Philadelphia, Pa.
Fabri-Valve Co. of America, Portland, Ore.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (Chemical stoneware & porcelain)
Gilbert Brass Foundry Co., St. Louis, Mo.
Hamer Valves Inc., Long Beach, Calif.
Hasco Valve & Machine Co., Milwaukee, Wis.
Hays Mfg. Co., Erie, Pa.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Knight, Maurice A., Akron, O. (Stoneware)
Ladish Co., Tri-Clover Div., Kenosha, Wis.
Ludlow Valve Mfg. Co., Inc., Troy, N. Y.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mueller Co., Decatur, Ill.
National Airoil Burner Co., Inc., Philadelphia, Pa.
Ohio Injector Co., Wadsworth, O.
P-K Industries, Inc., North Arlington, N. J.
Parks-Cramer Co., Fitchburg, Mass. (jacketed)
Pittsburgh Brass Mfg. Co., Pittsburgh, Pa.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Reynolds Shaffer Co., Detroit, Mich.
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa. (lubricated)
Rockwood Sprinkler Co., Worcester, Mass.
Saran Lined Pipe Co., Ferndale, Mich. (Saran lined)
Smith Co., S. Morgan, York, Pa.
Star Stainless Screw Co., Paterson, N. J.
Stockham Valves & Fittings, Birmingham, Ala.
Taylor Instrument Companies, Rochester, N. Y.
Thermac Co., Los Angeles, Calif.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Weatherhead Co., The, Cleveland, O.
Wedgeplug Valve Co., Inc., New Orleans, La.
Welsbach Corp., The, Kitson Div., Philadelphia, Pa.
Whittaker Co., Wm. R., Los Angeles, Calif.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, PRESSURE REDUCING AND REGULATING, AIR AND GAS

A-P Controls Corp., Milwaukee, Wis.
American Car & Foundry Co., New York.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bellows Co., The, Akron, O.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
CCA Products, Inc., Glendale, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Central Brass Mfg. Co., Cleveland, O.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Philadelphia, Pa.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument & Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
DeVilbiss Co., The, Toledo, O.
Dockson Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electric Sprayit Div., Thomas Industries, Inc., Sheboygan, Wis.
Fisher Governor Co., Marshalltown, Ia.
Flexible Valve Corp., Palisades Park, N. Y.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hammel-Dahl Co., Providence, R. I.
Harris Calorific Co., The, Cleveland, O.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Hubbell Corp., Mundelein, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Regulator Corp., Cincinnati, O.
Keckley Co., O. C., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Liquid Carbonic Corp., The, Chicago, Ill.
Locke Regulator Co., Salem, Mass.
Marine & Industrial Products Co., Philadelphia, Pa.
Mason-Neilan Regulator Co., Boston, Mass.
Maxitrol Co., Detroit, Mich.
McAlear Mfg. Co., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Modern Engineering Co., St. Louis, Mo.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Norgren Co., C. A., Englewood, Colo.
Norwalk Valve Co., South Norwalk, Conn.
P-K Industries, Inc., North Arlington, N. J.
Powers Regulator Co., Skokie, Ill.
Research Vacuum Supply Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Strong, Carlisle & Hammond Co., Cleveland, O.
Sullivan Valve & Engineering Co., Butte, Mont.
Swartwout Co., The, Cleveland, O.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Tryco Products, Inc., Westfield, Mass.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., Newark, N. J.

VALVES, PRESSURE REDUCING AND REGULATING, HOT WATER

A-P Controls Corp., Milwaukee, Wis.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Boylston Steam Specialty Co., Chicago, Ill.

Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Cla-Val Co., Alhambra, Calif.
Conoflow Corp., Philadelphia, Pa.
Cooper Co., Clark, Palmyra, N. J.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dunham Co., C. A., Chicago, Ill.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Hammel-Dahl Co., Providence, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jordan Regulator Corp., Cincinnati, O.
Kainer & Co., Chicago, Ill.
Keckley Co., O. C., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Chicago, Ill.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schaible Co., The, Cincinnati, O.
Scientific Instrument Co., Detroit, Mich.
Spence Engineering Co., Inc., Walden, N. Y.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond Co., Cleveland, O.
Swartwout Co., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Taylor Instrument Companies, Rochester, N. Y.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, LaCrosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Vapor Heating Corp., Chicago, Ill.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.
Weston Electrical Instrument Corp., Newark, N. J.
White Flomatic Corp., Hoosick Falls, N. Y.

VALVES, PRESSURE REDUCING AND REGULATING, STEAM

Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Bailey Meter Co., Cleveland, O.
Black-Sivall & Bryson, Inc., Kansas City, Mo.
Boylston Steam Specialty Co., Chicago, Ill.
Bristol Co., The, Waterbury, Conn.
Brooke Engineering Co., Inc., Philadelphia, Pa.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Chaplin-Fulton Mfg. Co., Pittsburgh, Pa.
Clark Mfg. Co., Cleveland, O.
Cochrane Corp., Philadelphia, Pa.
Conoflow Corp., Philadelphia, Pa.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill.
Defender Instrument and Regulator Co., St. Louis, Mo.
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dunham Co., C. A., Chicago, Ill.
Eclipse Fuel Engineering Co., Rockford, Ill.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hagan Corp., Pittsburgh, Pa.
Hammel-Dahl Co., Providence, R. I.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Chicago, Ill.
Jordan Regulator Corp., Cincinnati, O.
Keckley Co., O. C., Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Leslie Co., Lyndhurst, N. J.
Locke Regulator Co., Salem, Mass.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marine & Industrial Products Co., Philadelphia, Pa.
Mason-Neilan Regulator Co., Boston, Mass.
McAlear Mfg. Co., Chicago, Ill.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island, N. Y.
P-K Industries, Inc., North Arlington, N. J.
Powers Regulator Co., Skokie, Ill.
Republic Flow Meters Co., Chicago, Ill.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Scientific Instrument Co., Detroit, Mich.
Shallcross Controls, Inc., Milwaukee, Wis.
Spence Engineering Co., Inc., Walden, N. Y.
Squires Co., C. E., The, Cleveland, O.
Staples & Pfeiffer, San Francisco, Calif.
Stickle Steam Specialties Co., Indianapolis, Ind.
Strong, Carlisle & Hammond Co., Cleveland, O.
Swartwout Co., The, Cleveland, O.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corps., Indianapolis, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Trerice Co., H. O., Detroit, Mich.
Vapor Heating Corp., Chicago, Ill.
Warren Engineering Co., Broadway, N. J.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Weston Electrical Instrument Corp., Newark, N. J.

VALVES, PUMP

Anchor Packing Co., Philadelphia, Pa.
Burrows Mfg. Co., F. A., York, Pa.
Cla-Val Co., Alhambra, Calif.
Dick Co., Inc., R. & J., Passaic, N. J.
Durabla Mfg. Co., New York, N. Y.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Garlock Packing Co., Palmyra, N. Y.
Goodrich Co., B. F., Akron, O.
Jacuzzi Bros., Inc., Richmond, Calif.
Madden Corp., The, Chicago, Ill.
New York Belting & Packing Co., Passaic, N. J.
Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Quaker Rubber Corp., Div. of H. K. Porter Co., Inc., Philadelphia, Pa.
Sims Pump Valve Co., Hoboken, N. J.
United States Rubber Company, New York, N. Y.
Watts Regulator Co., Lawrence, Mass.
White Flomatic Corp., Hoosick Falls, N. Y.
Williams Gauge Co., Inc., The, Pittsburgh, Pa.

VALVES, QUICK OPENING

Central Brass Mfg. Co., Cleveland, O.
Crane Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Darling Valve & Mfg. Co., Williamsport, Pa.
Dole Refrigerating Co., Chicago, Ill.
Everlasting Valve Co., Jersey City, N. J.
Fairbanks Co., The, New York, N. Y.
Flexible Valve Corp., Palisades Park, N. Y.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Hasco Valve & Machine Co., Milwaukee.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McRae Corp., Glendale, Calif.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Nason Co., Clarkston, Mich.
Ohio Brass Co., Mansfield, O.
Ohio Injector Co., Wadsworth, O.
OPW Corp., Cincinnati, O.
P-K Industries, Inc., North Arlington, N. J.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Powell Co., Wm., The, Cincinnati, O.
Research Vacuum Supply Co., Chicago, Ill.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., New York, N. Y.
Superior Valve & Fittings Co., Pittsburgh, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Walworth Co., New York, N. Y.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.

VALVES, RADIATOR, AIR, FOR HOT WATER RADIATORS

Anderson Products, Inc., Cambridge, Mass.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Dole Valve Co., The, Chicago, Ill.
G & H Mfg. Co., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Keeney Mfg. Co., Newington, Conn.
Maid-O'Mist, Inc., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
New York Air Valve Corp., Brooklyn, N. Y.
Powell Co., Wm., The, Cincinnati, O.
Quality Specialty Co., Inc., Camden, N. J.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Thrush & Co., H. A., Peru, Ind.

VALVES, RADIATOR, AIR, FOR STEAM RADIATORS

Anderson Products, Inc., Cambridge, Mass.
Bridgeport Brass Co., Bridgeport, Conn.
Chicago Specialty Mfg. Co., Chicago, Ill.
Detroit Controls Corp., Detroit, Mich.
Dole Valve Co., The, Chicago, Ill.
Gorton Heating Co., Cranford, N. J.
Heat Timer Corp., New York, N. Y.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jenkins Bros., New York, N. Y.
Keeney Mfg. Co., Newington, Conn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
New York Air Valve Corp., Brooklyn, N. Y.
Ohio Injector Co., Wadsworth, O.
Positive Control Co., The, Cincinnati, O.
Powell Co., Wm., The, Cincinnati, O.
Radiator Valve Co. of America, Philadelphia, Pa.
Riggio Co., Frank D., Rutherford, N. J.
Squires Co., C. E., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, ELECTRIC

Barber-Colman Co., Rockford, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Jenkins Bros., New York, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sarcotherm Controls, Inc., New York, N. Y.
Vapor Heating Corp., Chicago, Ill.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, PACKLESS

Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, PNEUMATIC

Johnson Service Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Powers Regulator Co., Skokie, Ill.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, SELF-CONTAINED

Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Sarco Co., Inc., New York, N. Y.
Squires Co., C. E. The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trane Co., The, LaCrosse, Wis.

VALVES, RADIATOR, AUTOMATIC TEMPERATURE CONTROL, SELF-CONTAINED, PACKLESS

Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.

VALVES, RADIATOR, ORIFICE

Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham Co., C. A., Chicago, Ill.
Grinnell Co., Inc., Providence, R. I.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Marsh Valve Co., Dunkirk, N. Y.
New York Air Valve Corp., Brooklyn, N. Y.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Simplex Heating Specialty Co., Inc., Lynchburg, Va.
Tallmadge Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Trane Co., The, LaCrosse, Wis.
Webster & Co., Warren, Camden, N. J.

VALVES, RADIATOR, STEAM AND HOT WATER, HAND

Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Chase Brass & Copper Co., Waterbury, Conn.
Crane Co., Chicago, Ill.
Detroit Controls Corp., Detroit, Mich.
Dunham Co., C. A., Chicago, Ill.
Fairbanks Co., The, New York, N. Y.
Haines & Co., Inc., William S., Div. Sellers Injector Corp., Philadelphia, Pa.
Hammond Brass Wks, Hammond, Ind.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kennedy Valve Mfg. Co., Elmira, N. Y.
Kritzer Radiant Coils, Inc., Chicago, Ill.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Milwaukee Valve Co., Milwaukee, Wis.
Ohio Brass Co., Mansfield, O.
Powell Co., Wm., The, Cincinnati, O.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Schaible Co., The, Cincinnati, O.
Scott Valve Mfg. Co., Detroit, Mich.
Squires Co., C. E., The, Cleveland, O.
Sterling, Inc., Milwaukee, Wis.
Trane Co., The, La Crosse, Wis.
United States Radiator Corp., Detroit, Mich.
Webster & Co., Warren, Camden, N. J.

VALVES, RADIATOR, STEAM AND HOT WATER, MODULATING

Barnes & Jones, Inc., Boston, Mass.
Cashin Co., W. D., Boston, Mass.
Dunham Co., C. A., Chicago, Ill.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
Haines & Co., Inc., William S., Div. Sellers Injector Corp., Philadelphia, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Johnson Service Co., Milwaukee, Wis.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Valve Co., Dunkirk, N. Y.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Ohio Brass Co., Mansfield, O.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Squires Co., C. E., The, Cleveland, O.
Sterling Inc., Milwaukee, Wis.
Vapor Specialty Co., New York, N. Y.
Webster & Co., Warren, Camden, N. Y.

VALVES, REFRIGERATION (ANGLE, CHECK, GATE, GLOBE, NEEDLE, RELIEF)

A-P Controls Corp., Milwaukee, Wis.
Bakeraire Corp., South Windham, Me.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Central Brass Mfg. Co., Cleveland, O.
Crane Co., Chicago, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Farris Engineering Corp., Palisades Park, N. J.
Frick Co., Waynesboro, Pa.
Hammel-Dahl Co., Providence, R. I.
Henry Valve Co., Melrose Park, Ill.
Hills-McCanna Co., Chicago, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Lunkenheimer Co., Cincinnati, O.
Marsh Instrument Co., Skokie, Ill.
Mueller Brass Co., Port Huron, Mich.
Reynolds Mfg. Co., Inc., Springfield, Mo.
Shank Co., Cyrus, Chicago, Ill.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Techniflex Corp., Port Jervis, N. Y.
Vilter Mfg. Co., Milwaukee, Wis.
Vogt Machine Co., Henry; Louisville, Ky.
Worthington Corp., Harrison, N. J.
X L Refrigerating Co., Chicago, Ill.
York Corp., York, Pa.

VALVES, REFRIGERATION, BACK PRESSURE

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Bailey Co., Chas. M., San Francisco, Calif.
Bakeraire Corp., South Windham, Me.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Dersch, Gesswein & Neuert, Inc., Chicago, Ill.
Electrimatic Co., Sales Affiliate, Jas. P. Marsh Corp., Skokie, Ill.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hammel-Dahl Co., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Lonergan Co., J. E., Philadelphia, Pa.
Mueller Brass Co., Port Huron, Mich.
Schnacke, Inc., Evansville, Ind.
Taylor Instrument Companies, Rochester, N. Y.
Temprite Products Corp., Birmingham, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
X L Refrigerating Co., Chicago, Ill.

VALVES, REFRIGERATION, EXPANSION, CONSTANT PRESSURE

A-P Controls Corp., Milwaukee, Wis.
Alco Co., St. Louis, Mo.
Bakeraire Corp., South Windham, Me.
Cash Co., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Detroit Controls Corp., Detroit, Mich.
Foster Engineering Co., Union, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hammel-Dahl Co., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
Lonergan Co., J. E., Philadelphia, Pa.
Mayson Mfg. Co., Detroit, Mich.
Vilter Mfg. Co., The, Milwaukee, Wis.
X L Refrigerating Co., Chicago, Ill.

VALVES, REFRIGERATION, EXPANSION, THERMOSTATIC

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Cutler-Hammer Inc., Milwaukee, Wis.
Detroit Controls Corp., Detroit, Mich.
Frigidaire Div., General Motors Corp., Dayton, O.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Mayson Mfg. Co., Detroit, Mich.
Peerless of America, Inc., Chicago, Ill.
Sporlan Valve Co., St. Louis, Mo.
Tenney Engineering, Inc., Union, N. J.
X L Refrigerating Co., Chicago, Ill.

VALVES, REFRIGERATION, FLOAT, HIGH PRESSURE

Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Armstrong Machine Works, Three Rivers, Mich.
Foster Engineering Co., Union, N. J.
Frick Co., Waynesboro, Pa.
Hubbell Corp., Mundelein, Ill.
Mercoid Corp., Chicago, Ill.
Phillips & Co., H. A., Chicago, Ill.
Temprite Products Corp., Birmingham, Mich.
Vilter Mfg. Co., Milwaukee, Wis.
Wabash Corp., Chicago, Ill.
York Corp., York, Pa.

VALVES, REFRIGERATION, FLOAT, HIGH PRESSURE AND LOW PRESSURE

Mayson Mfg. Co., Detroit, Mich.
Phillips & Co., H. A., Chicago, Ill.
Temprite Products Corp, Birmingham, Mich.
Vilter Mfg. Co., Milwaukee, Wis.
Voss Co., J. H. H., Inc., New York, N. Y.
York Corp., York, Pa.

VALVES, REFRIGERATION, LIQUID CONTROL, FLOAT PILOTED

Alco Valve Co., St. Louis, Mo.
Cooper Co., Clark, Palmyra, N. J.
Frick Co., Waynesboro, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Magnetro, Inc., Chicago, Ill.
Phillips & Co., H. A., Chicago, Ill.
York Corp., York, Pa.

VALVES, REFRIGERATION, MAGNETIC STOP

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Automatic Switch Co., Orange, N. J.
Detroit Controls Corp, Detroit, Mich.
Electrimatic Co., Sales Affiliate, Jas. P. Marsh Corp., Skokie, Ill.
Frick Co., Waynesboro, Pa.
General Controls Co., Glendale, Calif., and Skokie, Ill.
Hubbell Corp., Mundelein, Ill.
Mercoid Corp., Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Sporlan Valve Co., St. Louis, Mo.

VALVES, REFRIGERATION, TEMPERATURE REGULATING OR SNAP ACTION SUCTION

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Frigidaire Div., General Motors Corp., Dayton, O.
Temprite Products Corp., Birmingham, Mich.

VALVES, REFRIGERATION, WATER REGULATING, PRESSURE OR TEMPERATURE ACTUATED

A-P Controls Corp., Milwaukee, Wis.

Alco Valve Co., St. Louis, Mo.
Aminco Refrigeration Products, American Injector Co., Detroit, Mich.
Art Valve Co., Chicago, Ill.
Bailey Co., Chas. M., San Francisco, Calif.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cooper Co., Clark, Palmyra, N. J.
Electrimatic Co., Sales Affiliate, Jas. P. Marsh Corp., Skokie, Ill.
Farris Engineering Corp., Palisades Park, N. J.
Farris Stacon Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Frigidaire Div., General Motors Corp., Dayton, O.
Jordan Regulator Corp., Cincinnati, O.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Mfg. Co., Hamilton, O.
Mayson Mfg. Co., Detroit, Mich.
Mercoid Corp., Chicago, Ill.
Penn Controls, Inc., Goshen, Ind.
Perfection Refrigeration Parts Co., Harvey, Ill.
Powers Regulator Co., Skokie, Ill.
Sarco Co., Inc., New York, N. Y.
Spence Engineering Co., Inc., Walden, N. Y.
York Corp., York, Pa.

VALVES, RELIEF, HOT WATER, COMBINED PRESSURE AND TEMPERATURE OPERATED

Atlas Valve Co., Newark, N. J.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cooper Co., Clark, Palmyra, N. J.
Fisher Govenor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Kainer & Co., Chicago, Ill.
Kunkle Valve Co., Ft. Wayne, Ind.
McDonnell & Miller, Inc., Chicago, Ill.
Mueller Co., Decatur, Ill.
Patrol Valve Co., The, Cleveland, O.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Schaible Co., The, Cincinnati, O.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Thrush & Co., H. A. Peru, Ind.
Trane Co., The, La Crosse, Wis.
Watts Regulator Co., Lawrence, Mass.
Welsbach Corp., The, Kitson Div., Philadelphia, Pa.

VALVES, RELIEF, HOT WATER, PRESSURE OPERATED

Ashton Valve Co., Wrentham, Mass.
Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Central Brass Mfg. Co, Cleveland, O.
Cla-Val Co., Alhambra, Calif.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Davis Regulator Co., Chicago, Ill
d'Este Div., Kaye & MacDonald, Inc., West Orange, N. J.
Dunham Co., C. A., Chicago, Ill.
Durabla Mfg. Co., New York, N. Y.
Eddy Valve Co., Waterford, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Hoffman Specialty Mfg. Corp., Indianapolis, Ind.
Jordan Regulator Corp., Cincinnati, O.
Kainer & Co., Chicago, Ill.
Keckley Co., O. C., Chicago, Ill.
Kehm Corp., The, Chicago, Ill.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Kunkle Valve Co., Ft. Wayne, Ind.
Lonergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marine & Industrial Products Co., Philadelphia, Pa.
McAlear Mfg. Co., Chicago, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Mueller Co., Decatur, Ill.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Patrol Valve Co., The, Cleveland, O.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Schaible Co., The, Cincinnati, O.
Scott Valve Mfg. Co., Detroit, Mich.
Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Staples & Pfeiffer, San Francisco, Calif.
Swartwout Co., The, Cleveland, O.
Taco Heaters, Inc., Cranston, R. I.
Texsteam Corp., Houston, Tex.
Thrush & Co., H. A., Peru, Ind.
Trane Co., The, La Crosse, Wis.
Trerice Co., H. O., Detroit, Mich.
Triplex Heating Specialty Co., Inc., Peru, Ind.
Tryco Products, Inc., Westfield, Mass.
Watson & McDaniel Co., Philadelphia, Pa.
Watts Regulator Co., Lawrence, Mass.
Welsbach Corp., The, Kitson Div., Philadelphia, Pa.
Weston Electrical Instrument Corp., Newark, N. J.

VALVES, RELIEF, HOT WATER, PRESSURE OPERATED, SELF-FILLING

Bailey Co., Chas. M., San Francisco, Calif.
Beaton & Cadwell Mfg. Co., New Britain, Conn.
Bell & Gossett Co., Morton Grove, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Crane Co., Chicago, Ill.
Kehm Corp., The, Chicago, Ill.
Klipfel Valves, Inc., Hamilton, O.
McDonnell & Miller, Inc., Chicago, Ill.
Mueller Co., Decatur, Ill.
Quality Specialty Co., Inc., Camden, N. J.
Sall Bros. Co., Rockford, Ill.
Sarcotherm Controls, Inc., New York, N. Y.
Thrush & Co., H. A., Peru, Ind.
Watts Regulator Co., Lawrence, Mass.
Webster & Co., Warren, Camden, N. J.

VALVES, RELIEF, HYDRAULIC

Ashton Valve Co., Wrentham, Mass.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Blackhawk Mfg. Co., Milwaukee, Wis.
Cameron Iron Works, Inc., Houston, Tex.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cla-Val Co., Alhambra, Calif.
Cooper Co., Clark, Palmyra, N. J.
Commercial Shearing & Stamping Co., Youngstown, O.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Farris Engineering Corp., Palisades Park, N. J.
Foster Engineering Co., Union, N. J.
Fulflo Specialties Co., Inc., The, Blanchester, O.
General Controls Co., Glendale, Calif.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
James-Pond-Clark, Pasadena, Calif.
Keckley Co., O. C., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kunkle Valve Co., Ft. Wayne, Ind.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Lonergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marine & Industrial Products Co., Philadelphia, Pa.
McDonnell & Miller, Inc., Chicago, Ill.
Pantex Mfg. Corp., Hydraulic Div., Pawtucket, R. I.
Ross Valve Mfg. Co., Troy, N. Y.
Scott Valve Mfg. Co., Detroit, Mich.
Sinclair-Collins Valve Co., Akron, O.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.

VALVES, RELIEF, OIL

American Car & Foundry Co., New York, N. Y.
Andale Co., Philadelphia, Pa.
Ashton Valve Co., Wrentham, Mass.
Associated Valve & Engineering Co., Chicago, Ill.
Atlas Valve Co., Newark, N. J.
Bailey Co., Chas. M., San Francisco, Calif.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Central Brass Mfg. Co., Cleveland, O.
Cla-Val Co., Alhambra, Calif.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Davis Regulator Corp., Chicago, Ill.
Durabla Mfg. Co., New York, N. Y.
Edward Valves, Inc., East Chicago, Ind.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Foster Engineering Co., Union, N. J.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Greer Hydraulics, Inc., Brooklyn, N. Y.
Grove Valve and Regulator Co., Oakland, Calif.
Hammel-Dahl Co., Providence, R. I.
Hubbell Corp., Mundelein, Ill.
James-Pond-Clark, Pasadena, Calif.
Keckley Co., O. C., Chicago, Ill.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Klipfel Valves, Inc., Hamilton, O.
Kunkle Valve Co., Ft. Wayne, Ind.
Lancaster Heat Transfer Co., Inc., Brooklyn.
Locke Regulator Co., Salem, Mass.
Lonergan Co., J. E., Philadelphia, Pa.
Lunkenheimer Co., Cincinnati, O.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marine & Industrial Products Co., Philadelphia, Pa.
Maxon Premix Burner Co., Muncie, Ind.
McDonald Mfg. Co., A. Y., Dubuque, Ia.
McDonnell & Miller, Inc., Chicago, Ill.
Milwaukee Valve Co., Milwaukee, Wis.
Morrison Brothers Co., Dubuque, Ia.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Pantex Mfg. Corp., Hydraulics Div., Pawtucket, R. I.
Preferred Utilities Mfg. Corp., New York, N. Y.
Ross Valve Mfg. Co., Inc., Troy, N. Y.
Schade Valve Mfg. Co., Philadelphia, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Staples & Pfeiffer, San Francisco, Calif.
Texsteam Corp., Houston, Tex.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Watson & McDaniel Co., Philadelphia, Pa.

VALVES, SADDLE

Beckett & Co., Inc., Thomas, Dallas, Tex.
Darling Valve & Mfg. Co., Williamsport, Pa.
Fairbanks Co., The, New York, N. Y.
Imperial Brass Mfg. Co., Chicago, Ill.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Maid-O'-Mist, Inc., Chicago, Ill.
Okadee Co., Chicago, Ill.
Walworth Co., New York, N. Y.

VALVES, SAFETY CLEANOUT

Liquidepth Indicators, Inc., Long Island City, N. Y.

VALVES, SAFETY, STEAM

American Car & Foundry Co., New York, N. Y.
Ashton Valve Co., Wrentham, Mass.
Associated Valve & Engineering Co., Chicago, Ill.
Cooper Co., Clark, Palmyra, N. J.
Crane Co., Chicago, Ill.
Crosby Steam Gage & Valve Co., Wrentham, Mass.
Eclipse Fuel Engineering Co., Rockford, Ill.
Farris Engineering Corp., Palisades Park, N. J.
Foster Engineering Co., Union, N. J.
Keckley Co., O. C., Chicago, Ill.
Kunkle Valve Co., Ft. Wayne, Ind.
Lonergan Co., J. E., Philadelphia, Pa.

Lunkenheimer Co., Cincinnati, O.
McRae Corp., Glendale, Calif.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Marine & Industrial Products Co., Philadelphia, Pa.
New York Air Valve Corp., Brooklyn, N. Y.
North American Mfg. Co., Cleveland, O.
Powell Co., Wm., The, Cincinnati, O.
Scott Valve Mfg. Co., Detroit, Mich.
Texsteam Corp., Houston, Tex.
Trerice Co., H. O., Detroit, Mich.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Vapor Heating Corp., Chicago, Ill.
Vernon Tool Co., Ltd., Alhambra, Calif.

VALVES, SLIDE

Barksdale Valves, Los Angeles, Calif.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Fabri-Valve Co. of America, Portland, Ore.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (chemical stoneware)
Jenkins Bros., New York, N. Y.
Morganite, Inc., Carbon Specialties Div., Long Island City, N. Y.
Ohio Injector Co., Wadsworth, O.
Rockwell Co., W. S., Fairfield, Conn.
Walworth Co., New York, N. Y.
Whittaker Co., Wm. R., Los Angeles, Calif.

VALVES, SOLDER JOINT

American Brass Co., Waterbury, Conn.
Central Brass Mfg. Co., Cleveland, O.
Chase Brass & Copper Co., Waterbury, Conn.
Cleveland Brass Mfg. Co., The, Cleveland, O.
Crane Co., Chicago, Ill.
Darling Valve & Mfg. Co., Williamsport, Pa.
Detroit Brass & Malleable Co., Detroit, Mich.
Fairbanks Co., The, New York, N. Y. (also brazed-end)
Hammond Brass Works, Hammond, Ind.
Henry Valve Co., Melrose Park, Ill.
Imperial Brass Mfg. Co., Chicago, Ill.
Jenkins Bros., New York., N. Y.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kerotest Mfg. Co., Pittsburgh, Pa.
Mueller Brass Co., Port Huron, Mich.
Northern Indiana Brass Co., Elkhart, Ind.
Ohio Brass Co., Mansfield, O.
Pittsburgh Valve Co., Reedsville, W. Va.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Powell Co., Wm., The, Cincinnati, O.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Scott Valve Mfg. Co., Detroit, Mich.
Superior Valve and Fittings Co., Pittsburgh, Pa.
Valco, Inc., Cincinnati, O.
Walworth Co., New York, N. Y. (Brazed)

VALVES, SOLENOID

A-P Controls Corp., Milwaukee, Wis.
Alco Valve Co., St. Louis, Mo.
Associated Valve & Engineering Co., Chicago, Ill.
Atkomatic Valve Co., Inc., Indianapolis, Ind.
Automatic Switch Co., Orange, N. J.
Barksdale Valves, Los Angeles, Calif.
Bellows Co., The, Akron, O.
Cla-Val Co., Alhambra, Calif.
Cooper Co., Clark, Palmyra, N. J.
Copes-Vulcan Div., Continental Foundry & Machine Co., Erie, Pa.
Cutler-Hammer, Inc., Milwaukee, Wis.
Davis Regulator Co., Chicago, Ill.
Detroit Controls Corp., Detroit, Mich.
Eclipse Fuel Engineering Co., Rockford, Ill.
Electrimatic Co., Sales Affiliate, Jas. P. Marsh Corp., Skokie, Ill.
Erickson Specialty Co., Cohoes, N. Y.
Flexible Valve Corp., Palisades Park, N. Y.
Frick Co., Waynesboro, Pa.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Golden-Anderson Valve Specialty Co., Pittsburgh, Pa.
Grove Valve and Regulator Co., Oakland, Calif.
Hanna Engineering Wks., Chicago, Ill.
Hasco Valve & Machine Co., Milwaukee, Wis. (alloy)
Hays Mfg. Co., Erie, Pa.
Hook & Ackerman, Inc., New York, N. Y.
Hubbell Corp., Mundelein, Ill.
Hunt & Son, Inc., C. B., Salem, O.
Jackes-Evans Mfg. Co., Controls Div., St. Louis, Mo.
Johnson Corp., The, Three Rivers, Mich.
Keckley Co., O. C., Chicago, Ill.
Lammert & Mann Co., Chicago, Ill. (Gas safety shut-off)
Ledeen Mfg. Co., Los Angeles, Calif.
Locke Regulator Co., Salem, Mass.
Marsh Heating Equipment Co., Skokie, Ill.
Marsh Instrument Co., Skokie, Ill.
McDonnell & Miller, Inc., Chicago, Ill.
McQuay-Norris Mfg. Co., St. Louis, Mo.
McRae Corp., Glendale, Calif.
Milwaukee Gas Specialty Co., Milwaukee, Wis.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia
Nicholson & Co., W. H., Wilkes-Barre, Pa.
P-K Industries, Inc., North Arlington, N. J.
Paul Valve Corp., New York, N. Y.
Penn Controls, Inc., Goshen, Ind.
Perfex Corp., Milwaukee, Wis.
Pfening Co., Fred D., Columbus, O. (water and steam)
Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarco Co., Inc., New York, N. Y.
Sarcotherm Controls, Inc., New York, N. Y.
Scientific Instrument Co., Detroit, Mich.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Soreng Products Corp., Schiller Park, Ill.
Spence Engineering Co., Walden, N. Y.
Sporlan Valve Co., St. Louis, Mo.
Square D Co., Industrial Controller Div., Milwaukee, Wis.
Squires Co., C. E., The, Cleveland, O.
Superior Controls Co., Inc., Los Angeles, Calif.
Supreme Electric Products Corp., Rochester, N. Y.
Taylor-Winfield Corp., Warren, O.
Trerice Co., H. O., Detroit, Mich.
Vacuum-Electronic Engineering Co., New Hyde Park, L. I., N. Y.
Vapor Heating Corp., Chicago, Ill.
Webster Electric Co., Racine, Wis.
White-Rodgers Electric Co., St. Louis, Mo.
Whittaker Co., William R., Los Angeles, Calif.

VALVES, STEAM-JACKETED

Barrett Machine Co., Pittsburgh, Pa.
Cooper Co., Clark, Palmyra, N. J.
Darling Valve & Mfg. Co., Williamsport, Pa.
De Zurik Shower Co., Sartell, Minn.
Everlasting Valve Co., Jersey City, N. J.
Farris Engineering Corp., Palisades Park, N. J.
Fisher Governor Co., Marshalltown, Ia.
Hammel-Dahl Co., Providence, R. I.
Hasco Valve & Machine Co., Milwaukee, Wis.
Powell Co., Wm., The, Cincinnati, O.
Red Jacket Co., Inc., Pittsburgh, Pa.
U. S. Pipe & Mfg. Co., S. San Francisco, Calif.
Walworth Co., New York, N. Y.
Wedgeplug Valve Co., Inc., New Orleans, La.

VALVES, 2, 3 AND 4 WAY

Alco Valve Co., St. Louis, Mo.
American Car & Foundry Co., New York, N. Y.
Automatic Switch Co., Orange, N. J.
Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Barber-Colman Co., Rockford, Ill.
Barksdale Valves, Los Angeles, Calif.
Bellows Co., The, Akron, O.
Black-Sivalls & Bryson, Inc., Kansas City, Mo.
Bordo Co., Inc., L. J., Glenside, Pa.
Bristol Co., The, Waterbury, Conn.
Cash Co., A. W., Decatur, Ill.
Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Clark Controller Co., Cleveland, O.
Cla-Val Co, Alhambra, Calif.
Cooper Co., Clark, Palmyra, N. J.
Commercial Shearing & Stamping Co., Youngstown, O.
Crane Co., Chicago, Ill.
Davis Engineering Corp., Elizabeth, N. J.
Davis Regulator Co., Chicago, Ill.
Dahl, G. W., Bristol, R. I.
Detroit Brass & Malleable Co., Detroit, Mich.
Detroit Controls Corp., Detroit, Mich.
De Zurik Shower Co., Sartell, Minn.
Duriron Co., Inc., The, Dayton, O. (acid resisting)
Flexible Valve Corp., Palisades Park, N. Y.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
General Controls Co., Glendale, Calif. and Skokie, Ill.
Hammel-Dahl Co., Providence, R. I.
Hammond Brass Works, Hammond, Ind.
Hanna Engineering Wks., Chicago, Ill.
Henry Valve Co., Melrose Park, Ill.
Homestead Valve Mfg. Co., Coraopolis, Pa.
Hunt & Son, Inc., C. B., Salem, O.
Imperial Brass Mfg. Co., Chicago, Ill.
Johnson Service Co., Milwaukee, Wis.
Keller Tool Co., Grand Haven, Mich.
Kerotest Mfg. Co., Pittsburgh, Pa.
Kieley & Mueller, Inc., Middletown, N. Y.
Ledeen Mfg. Co., Los Angeles, Calif.
Lunkenheimer Co., Cincinnati, O.
Luzerne Rubber Co., Trenton, N. J. (Hard rubber)
McDonald Mfg. Co., A. Y., Dubuque, Ia.
Mercoid Corp., Chicago, Ill.
Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mueller Steam Specialty Co., Inc., Long Island City, N. Y.
Nicholson & Co., W. H., Wilkes-Barre, Pa.
Ohio Brass Co., Mansfield, O.
Penn Controls, Inc., Goshen, Ind.
Permutit Co., New York, N. Y.
Powell Co., Wm., Cincinnati, O.
Powers Regulator Co., Skokie, Ill.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Rockwell Mfg. Co., Meter and Valve Div., Pittsburgh, Pa.
Ruggles-Klingemann Mfg. Co., Boston, Mass.
Sarcotherm Controls, Inc., New York, N. Y.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Semet-Solvay Engineering Div., Allied Chemicals & Dye Corp., New York, N. Y.
Skinner Electric Valve Div., The Skinner Chuck Co., New Britain, Conn.
Smith Co., S. Morgan, York, Pa.
Taylor Instrument Companies, Rochester, N. Y.
Taylor-Winfield Corp., Warren, O.
Wach Co., E. H., The, Chicago, Ill.
Walworth Co., New York, N. Y. (Lubricated plug valves)
Warren Engineering Co., Broadway, N. J.
Weatherhead Co., The, Cleveland, O.
Williams Valve Co., D. T., Div. of The Schaible Co., Cincinnati, O.
Whittaker Co., Wm. R., Los Angeles, Calif.

VALVES, WATER GAGE

Associated Valve & Engineering Co., Chicago, Ill.
Keckley Co., O. C., Chicago, Ill.
Lunkenheimer Co., Cincinnati, O.
New York Air Valve Corp., Brooklyn, N. Y.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., Detroit, Mich.
Reliance Gauge Column Co., Cleveland, O.
Superior Controls Co., Inc., Los Angeles.

VANES, DUCT TURNING, PREFABRICATED

Anemostat Corp. of America, New York, N. Y. (Equalizing deflectors)
Barber-Colman Co., Rockford, Ill.
Carey Mfg. Co., Philip, The, Lockland, Cincinnati, O.
Duro-Dyne Corp., New Hyde Park, L. I. N. Y.
Elgen Mfg. Corp., Long Island City, N. Y.
Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Titus Mfg. Corp., Waterloo, Ia.
Tuttle & Bailey, Inc., New Britain, Conn.

VAPOR HEATING SYSTEMS

See Systems, Heating, Vapor

VAPORIZERS FOR PROPANE — BUTANE

Davis Engineering Corp., Elizabeth, N. J.
Mitchell Co., John E., Dallas, Tex.

VARIABLE SPEED DRIVES

See Changers, Speed, Hydraulic Coupling; Changers, Speed, Mechanical; Reducers, Speed; Pulleys and Sheaves, for Belt Drives

VARIABLE SPEED PULLEYS

See Changers, Speed, Mechanical

V-BELT DRIVES

See Drives, V-Belt

VELOCITY, REGULATORS

See Regulators, Air Velocity

VENT FLUE CAPS

See Caps, Vent Flue

VENTILATING HOSE

See Ducts and Duct Fittings, Prefabricated, Non-Metallic

VENTILATION HEATERS

See Surface, Finned, Heating; Ventilators, Roof, Fan; Ventilators, Unit

VENTILATORS, MUSHROOM

Brighton-Dickinson Div., Chicago, Ill.
Carnes Corp., Verona, Wis.
Chicago Blower Corp., Franklin Park, Ill.
Cook Co., Loren, Berea, O.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Jenn-Air Products Co., Indianapolis, Ind.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Knight, Maurice A., Akron, O. (Stoneware)
Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Muckle Mfg. Co., Owatonna, Minn.
Penn Ventilator Co., Philadelphia, Pa.
Ritter Pattern & Casting Co., Inc., New York, N. Y.
Van Noorden Co., E., Boston, Mass.

VENTILATORS, ROOF, FAN

Acme Equipment Co., Muskogee, Okla.
Aerovent Fan Co., Inc., Piqua, O.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Airjet Ventilator Co., El Monte, Calif.
Aladdin Heating Corp., San Leandro, Calif.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Blower Corp., Detroit, Mich.
American Steel Band Co., Pittsburgh, Pa.
Ammerman Co., C. L., Minneapolis, Minn.
Arex Co., Chicago, Ill.
Bar-Brook Mfg. Co., Inc., Shreveport, La.
Bertram Co., Harvey P., The, Cincinnati, O.
Bishop & Babcock Mfg. Co., Cleveland, O.
Breidert Co., G. C., San Fernando, Calif.
Brighton-Dickinson Div., Chicago, Ill.
Burt Mfg. Co., Akron, O.
Carnes Corp., Verona, Wis.
Century Fan & Ventilator Co., Stamford, Conn.
Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Chicago Blower Corp., Franklin Park, Ill.
Clay Equipment Corp., Cedar Falls, Ia.
Commercialaire, Inc., Brooklyn, N. Y.
Cook Co., Loren, Berea, O.
Dana Fan & Blower Corp., Cincinnati, O.
Davidson Hyduty Roof Fan Co., Newton, Mass.
De Bothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Donaldson Power Ventilator Co., N. Hollywood, Calif.
Electrovent Fan & Mfg. Co., Chicago, Ill.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Gallaher Co., The, Owatonna, Minn., & Omaha, Neb.
Gehri Co., Tacoma, Wash.
General Blower Co., Morton Grove, Ill.
Hartzell Propeller Fan Co., Piqua, O.
Hayes Furnace Mfg. & Supply Co., Los Angeles, Calif.
Heating Assurance, Inc., Spokane, Wash.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Ilg Electric Ventilating Co., Chicago, Ill.
International Engineering, Inc., Dayton, O.
Iona Ventilator Co., Inc., Philadelphia, Pa.
Iron Lung Ventilator Co., Cleveland, O.
Jeffrey Mfg. Co., Columbus, O.
Jenn-Air Products Co., Indianapolis, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
King Co., The, Owatonna, Minn.
Kody Blower Co., Trenton, N. J.
Lee & Son Co., Thomas, Cincinnati, O.
M & E Mfg. Co., Indianapolis, Ind.
Martin Fan & Blower Co., Chicago, Ill.
Mefco Mfg. Co., Air Conditioning Div., Glendale, Calif.
Moore Co., The, St. Louis, Mo.
Mountain States Equipment Co., Denver, Colo.
Muckle Mfg. Co., Owatonna, Minn.
New York Blower Co., Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Octagon Ventilator Co., Chicago, Ill.
Paache Airbrush Co., Chicago, Ill.
Peerless Electric Co., Warren, O.
Penn Ventilating Co., Philadelphia, Pa.
Phoenix Ventilator Co., Inc., Brooklyn, N. Y.
Propellair Div., Robbins & Myers Inc., Springfield, O.
Robertson Co., H. H., Pittsburgh, Pa.
Sargent Enginairing Co., Cleveland, O.
Somers, Inc., H. J., Detroit, Mich.
South Bend Air Products, Inc., South Bend, Ind.
Swartwout Co., The, Cleveland, O.
Trade-Wind Motorfans, Inc., Rivera, Calif.
Trane Co., The, La Crosse, Wis.
Tripar Products, Inc., Royal Oak, Mich.
Truflo Fan Co., Harmony, Pa.
Uno Ventilator Co., Malden, Mass.
Utility Fan Corp., Los Angeles, Calif.
Van Noorden Co., E., Boston, Mass.
Washburne & Co., E. G., New York, N. Y.
Waverly Heating Supply Co., Boston, Mass.
Western Engineering & Mfg. Co., Venice, Calif.
Wind-Way Fan & Ventilator Co., New Orleans, La.
Wing Mfg. Co., L. J., Linden, N. J.

VENTILATORS, ROOF, GRAVITY

Accurate Sheet Metal Mfg. Works, Chicago.
Air Control Products, Inc., Coopersville, Mich.
Air Devices, Inc., New York, N. Y.
Airjet Ventilator Co., El Monte, Calif.
Ajax Furnace Fitting Co., Div. of Cincinnati Sheet Metal & Roofing Co., Cincinnati, O.
Allen Cooler & Ventilator, Inc., Rochester, Mich.
American Metal Works, Inc., New Orleans.
American Steel Band Co., Pittsburgh, Pa.
Ammerman Co., C. L., Minneapolis, Minn.
Arex Co., Chicago, Ill.
Bertram Co., Harvey P., The, Cincinnati, O.
Breidert Co., G. C., San Fernando, Calif.
Brighton-Dickinson Div., Chicago, Ill.
Burt Mfg. Co., Akron, O.
Century Fan & Ventilator Co., Stamford, Conn.
Clay Equipment Corp., Cedar Falls, Ia.
Danzer Metal Works Co., Hagerstown, Md.
Empire Ventilation Equipment Co., Long Island City, N. Y.
Gehri Co., Tacoma, Wash.
Greenheck Bros. Mfg. Co., Schofield, Wis.
Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Inland Steel Products Co., Milwaukee, Wis.
Iona Ventilator Co., Inc., Philadelphia, Pa.
International Metal Products, Phoenix, Ariz.
Iwan Brothers, South Bend, Ind.
Jordan & Co., Inc., Paul R., Indianapolis, Ind.
Klauer Mfg. Co. Dubuque, Ia.
Kleenaire Corp., Stevens Point, Wis.
La Crosse Steel Roofing & Corrugating Co., La Crosse, Wis.
Lee & Son Co., Thomas, Cincinnati, O.
Levow, David, New York, N. Y.
Lyon, Conklin & Co., Inc., Baltimore, Md.
Moeschl-Edwards Corrugating Co., Inc., The, Cincinnati, O.
National Metal Fabricators, Chicago, Ill.
Newcomb-Detroit Co., Detroit, Mich.
Octagon Ventilator Co., Chicago, Ill.
Penn Ventilating Co., Philadelphia, Pa.
Phoenix Ventilator Co., Inc., Brooklyn, N. Y.
Pioneer Roofing & Sheet Metal Co., Muskogee, Okla.
Plasteel Products Corp., Washington, Pa.
Puhl & Hepper Mfg. Co., Inc., St. Louis, Mo.
Riggin Metal Products, Inc., Kankakee, Ill.
Robertson Co., H. H., Pittsburgh, Pa.
St. Paul Corrugating Co., St. Paul, Minn.
Sioux Steel Co., Sioux Falls, S. D.
Souther Iron Co., E. E., St. Louis, Mo.
Standard Ventilator Co., Lewisburg, Pa.
Swartwout Co., The, Cleveland, O.
Tierney Rotor Ventilator Co., Minneapolis, Minn.
Tiffin Eaves Trough Co., Tiffin, O.
Uno Ventilator Co., Malden, Mass.
Van Noorden Co., E., Boston, Mass.
Walker Jamar Co., Duluth, Minn.
Warner Ventilator Co., La Grange, Ind.
Waverly Heating Supply Co., Boston, Mass.
Western Engineering & Mfg. Co., Venice, Calif.
Willis Steel Corp., Galesburg, Ill.
York Corrugating Co., York, Pa.

VENTILATORS, UNIT

American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
American Blower Corp., Detroit, Mich.
Gannon Co., Inc., Russell R., The, Cincinnati, O.
Nesbitt, Inc., John J., Philadelphia, Pa.
Norman Products Co., Inc., Columbus, O. (gas fired)
Trane Co., The, LaCrosse, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.

VIBRATION ISOLATORS

See Absorbers, Vibration; Bases and Pads, Vibration Isolating; Hose, Metal and Fittings

VISCOSIMETERS

American Instrument Co., Inc., Silver Spring, Md.
Brabender Corp., Rochelle Park, N. J.
Bristol Co., The, Waterbury, Conn.
Brookfield Engineering Laboratories, Inc., Stoughton, Mass.
Daigger & Co., A., Chicago, Ill.
Electric Sprayit Div., Thomas Industries, Inc., Sheboygan, Wis.
Fischer & Porter Co., Hatboro, Pa.
Fish-Schurman Corp., New Rochelle, N. Y.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Greiner Co., Emil, New York, N. Y.
Humboldt Mfg. Co., Chicago, Ill.
Scientific Instrument Co., Detroit, Mich.
Thomas Co., Arthur H., Philadelphia, Pa.
Ultra-Viscoson Corp., The, Hartford, Conn.
Will Corp., Rochester, N. Y.

VISES, PIPE

American Pipe Tool Co., Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Austin Corp., Robert, Boston, Mass.
Beaver Pipe Tools, Inc., Warren, O. (Sawing—for tubing)
Billings & Spencer Co., Hartford, Conn.
Capewell Mfg. Co., Hartford, Conn.
Crown Die & Tool Corp., Chicago, Ill.
Desmond-Stephens Mfg. Co., Urbana, O.
Erie Tool Wks., Erie, Pa.
Hollands Mfg. Co., Erie, Pa.
Munton Mfg. Co., Franklin Park, Ill.
Nye Tool Co., Chicago, Ill.
Reed Mfg. Co., Erie, Pa.
Ridge Tool Co., Elyria, O.
Sac Tool Mfg. Co., St. Louis, Mo.
Springload Mfg. Corp., Seattle, Wash.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Vanderman Mfg. Co., Willimantic, Conn.
Williams & Co., J. H., Buffalo, N. Y.
Yost Mfg. Co., Meadville, Pa.

VISES, SHEET METAL WORKERS'

Desmond-Stephan Mfg. Co., Urbana, O.

WASHERS, AIR

Air & Refrigeration Corp., New York, N. Y.
Alton Mfg. Co., Dallas, Tex.
American Blower Corp., Detroit, Mich.
Bahnson Co., Winston-Salem, N. C.
Bayley Blower Co., Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Buensod-Stacey, Inc., New York, N. Y.
Buffalo Forge Co., Buffalo, N. Y.
Burdett Mfg. Co., Chicago, Ill.
Carrier Corp., Syracuse, N. Y.
Centri-Spray Corp., Livonia, Mich. (Wet type)
Clarage Fan Co., Kalamazoo, Mich.
Columbus Heating & Ventilating Co., Columbus, O.

Comfort Products Corp., Dallas, Tex.
Continental Air Filters, Inc., Louisville, Ky.
Drying Systems, Inc., Chicago, Ill.
Ducon Co., The, Mineola, N. Y.
Economy Equipment Co., Chicago, Ill.
Kauffman Air Conditioning Corp., St. Louis, Mo.
Marlo Coil Co., St. Louis, Mo.
Mountain States Equipment Co., Denver, Colo.
Parks-Cramer Co., Fitchburg, Mass.
Peters-Dalton, Inc., Detroit, Mich.
Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Schmieg Industries, Detroit, Mich.
Silco Products, Inc., Minneapolis, Minn.
Spray Engineering Co., Somerville, Mass.
Surface Combustion Corp., Toledo, O.
Tenney Engineering, Inc., Union, N. J.
Trane Co., The, LaCrosse, Wis.
Utility Appliance Corp., Los Angeles, Calif.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
York Corp., York, Pa.

WASHERS, FUME

Aqua-Therm, Inc., Dayton, O.
Burdett Mfg. Co., Chicago, Ill.
Ducon Co., The, Mineola, N. Y.
Heil Process Equipment Corp., Cleveland, O.
Knight, Maurice A., Akron, Ohio
Semet-Solvay Engineering Div., Allied Chemicals & Dye Corp., New York, N. Y.

WATER CHILLERS

See Chillers, Water, for Air Conditioning and Refrigeration, Compressors, Refrigerating, Combined with Condenser, Water Chiller, Piping Connections, and Controls

WATER HAMMER ELIMINATORS

See Absorbers, Shock, Liquid

WATER RAMS FOR CLEANING OUT PIPE LINES

See Rams, Water

WATER TREATMENT

See Treatment, Water; Devices, Electrolytic, for Preventing Corrosion

WELD TESTING MACHINES

See Machines, Testing, Weld

WELDERS, ARC

Air Reduction Sales Co., New York, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Birdsell Mfg. Co., Inc., Palo Alto, Calif.
Borm Mfg. Co., Elgin, Ill.
Burdett Oxygen Co. of Calif., Huntington Park, Calif.
Eisler Engineering Co., Inc., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Ergolyte Mfg. Co., Philadelphia, Pa.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Fern, Ralph, Scranton, Pa.
General Electric Co., Apparatus Sales Div., Schenectady, N. Y.
Generator Sales Co., Chicago, Ill.
Hammett Electric Mfg. Co., Kansas City, Mo.
Harnischfeger Corp., Milwaukee, Wis.
Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Hobart Bros. Co., Troy, O.
Kern Co., John A., Chicago, Ill.
Lee Co., K. O., Aberdeen, S. D.
Lincoln Electric Co., Cleveland, O.
Linde Air Products Co., The, Unit of Union Carbide & Carbon Corp., New York, N. Y. (Inert gas-shielded)
Marquette Mfg. Co., Minneapolis, Minn.
Metal & Thermit Corp., New York, N. Y.
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Electric Mfg. Co., Inc., Appleton, Wis.
National Cylinder Gas Co., Chicago, Ill.
Niagara Machine & Tool Wks., Buffalo, N. Y.
Precision Welder Mfg. Co., Chicago, Ill.
Sight Feed Generator Co., West Alexandria, O.
Smith Corp., A. O., Milwaukee, Wis.
Smith Welding Equipment Corp., Minneapolis, Minn.
Trindl Products, Ltd., Chicago, Ill.
Tweco Products Co., Wichita, Kan. (Cable connectors, electrode holders and accessories)
U. S. Electric Welder Corp., Toledo, O.
Welding Apparatus Co., Chicago, Ill.
Westinghouse Electric Corp., Pittsburgh, Pa.
Will-Weld Mfg. Co., Inc., Omaha, Neb.

WELDERS, SPOT

Acme Electric Welder Co., Los Angeles, Calif.
Acro Welder Mfg. Co., Milwaukee, Wis.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Alphil Spot Welding Co., Brooklyn, N. Y.
Birdsell Mfg. Co., Inc., Palo Alto, Calif.
DoAll Co., The, Des Plaines, Ill.
Duro-Dyne Corp., New Hyde Park, L. I. N. Y.
Eisler Engineering Co., Inc., Newark, N. J.
Electric Arc, Inc., Newark, N. J.
Federal Machine & Welder Co., The, Warren, O. (steam, flash, projection, special)
Fern, Ralph, Scranton, Pa.
Linde Air Products Co., The, Unit of Union Carbide & Carbon Corp., New York, N. Y. (Inert gas-shielded arc)
Micro Products Co., Chicago, Ill.
Mid-States Welder Mfg. Co., Chicago, Ill.
Miller Electric Mfg. Co., Inc., Appleton, Wis.
National Cylinder Gas Co., Chicago, Ill.
Peer, Inc., Benton Harbor, Mich.
Research Vacuum Supply Co., Chicago, Ill.
Rex Welder & Engineering Co., Kansas City, Mo.
Sciaky Bros., Inc., Chicago, Ill.
Taylor-Winfield Corp., Warren, O.
Thomson Electric Welder Co., Lynn, Mass.
Universal Power Corp., Cleveland, O.
Weldex, Inc., Detroit, Mich.
Westinghouse Electric Corp., Pittsburgh, Pa.

WELDERS, STUD

Eisler Engineering Co., Inc., Newark, N. J.
Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.
KSM Products, Inc., Merchantville, N. J.

WELDING AND CUTTING APPARATUS, OXY-ACETYLENE

Air Reduction Sales Co., New York, N. Y.
Allied Weld-Craft, Inc., Indianapolis, Ind.
Arcos Corp., Philadelphia, Pa. (arc-oxygen)
Atlas Welding Accessories Co., Ferndale, Mich. (Weld cleaning tools)
Dockson Corp., Detroit, Mich.
Evans Machine Co., Inc., Baltimore, Md.
Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Galv-Weld Products, Lima O. (Regalvanizing process)
General Scientific Equipment Co., Philadelphia, Pa.
Goss Gas, Inc., Pittsburgh, Pa.
Harris Calorific Co., The, Cleveland, O.
Industrial Gas Div., The Liquid Carbonic Corp., Chicago, Ill.
K-G Equipment Co., Allentown, Pa.
Linde Air Products Co., The, Unit of Union Carbide & Carbon Corp., New York, N. Y.
Liquid Carbonic Corp., The, Chicago, Ill.
Marquette Mfg. Co., Minneapolis, Minn.
Modern Engineering Co., St. Louis, Mo.
National Cylinder Gas Co., Chicago, Ill.
Powder Weld Process Co., The, Brooklyn, N. Y.
Sight Feed Generator Co., West Alexandria, O. (portable and stationary acetylene generators)
Smith Welding Equipment Corp., Minneapolis, Minn.
Tru-Line Corp., Santa Monica, Calif. (Protractor for marking pipe)
United Specialty Corp., El Dorado, Ark. (welding hose reel)
Victor Equipment Co., Welding Equipment Div., San Francisco, Calif.
Weldit, Inc., Detroit, Mich.

WELDING FUME COLLECTORS

See Exhausters, Welding Fume

WELLS, THERMOMETER

Airserco Mfg. Co., Inc., Pittsburgh, Pa.
Campbell Co., J. A., Long Beach, Calif.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Foxboro Co., Foxboro, Mass.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J. (graphite)
Maloney Co., F. H., Houston, Tex.
Manning, Maxwell & Moore, Inc., Stratford, Conn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
Pacific Transducer Corp., Los Angeles, Calif.
Philadelphia Thermometer Co., Philadelphia, Pa.
Rochester Mfg. Co., Inc., Rochester, N. Y.
Trinity Equipment Corp., Roselle Park, N. J.
Weksler Thermometer Corp., Freeport, N. Y.

WHEELS, BLOWER

Advance Aluminum Castings Corp., Chicago.
Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Barry Blower Co., Minneapolis, Minn.
Bayley Blower Co. Milwaukee, Wis.
Bishop & Babcock Mfg. Co., Cleveland, O.
Brundage Co., The, Kalamazoo, Mich.
Burden Div., Torrington Mfg. Co., Los Angeles, Calif.
Carolina Blower Co., Inc., Greensboro, N. C.
Champion Blower & Forge Co., Lancaster, Pa.
Clarage Fan Co., Kalamazoo, Mich.
General Blower Co., Morton Grove, Ill.
Hastings Air Conditioning Co., Hastings, Neb.
Jaden Mfg. Co., Hastings, Neb.
Jan-Air, Inc., Richmond, Ill.
Lau Blower Co., Dayton, O.
Martin Fan & Blower Co., Chicago, Ill.
Mayne Products Co., Dayton, O.
Morrison Products, Inc., Cleveland, O.
New York Blower Co., Chicago, Ill.
Palmer Mfg. Corp., Phoenix, Ariz.
Peerless Electric Co., Warren, O.
Revcor, Carpentersville, Ill.
Schwitzer-Cummins Co., Indianapolis, Ind.
Torrington Mfg. Co., The, Western Div., Van Nuys, Calif.
Torrington Mfg. Co., Torrington, Conn.
Triangle Mfg. Co., Oshkosh, Wis.
United States Air Conditioning Corp., Minneapolis, Minn.
Utility Appliance Corp., Los Angeles, Calif.
Utility Fan Corp., Div. of Utility Appliance Corp., Los Angeles, Calif.
Western Blower Co., Seattle, Wash.
Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.

WINDOW PANELS FOR AIR CONDITIONERS

See Panels, Window, for Air Conditioners

WINDOWS, HEAT INSULATING

Anderson Corp., Bayport, Minn.
Chamberlin Co. of America, Detroit, Mich.
Kane Mfg. Corp., Kane, Pa.
Libbey-Owens-Ford Glass Co., Toledo, O.
Mississippi Glass Co., St. Louis, Mo.
Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Russell Co., F. C., The, Cleveland, O.

WIRE, ELECTRIC, NUMBERED, FOR CONTROL SYSTEMS

Chester Cable Corp., Chester, N. Y.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo, O.
Essex Wire Corp., Ft. Wayne, Ind.
Midwest Air Conditioning Co., Des Moines, Ia.
Midwest Automatic Control Co., Des Moines, Ia.
United States Rubber Co., New York, N. Y.
Western Lithograph Co., Los Angeles, Calif.

WIRE, INSTRUMENT

Chester Cable Corp., Chester, N. Y.
Essex Wire Corp., Ft. Wayne, Ind.
Minneapolis-Honeywell Regulator Co., Industrial Div., Philadelphia, Pa.
United States Rubber Co., New York, N. Y.

WIRE, OIL BURNER IGNITION

Chester Cable Corp., Chester, N. Y.
Essex Wire Corp., Ft. Wayne, Ind.
United States Rubber Co., New York, N. Y.

WIRING, COMPLETE ASSEMBLIES, CUSTOM-MADE

Chester Cable Corp., Chester, N. Y.
Cornish-Rutland Co., Rutland, Vt.
Essex Wire Corp., Ft. Wayne, Ind.

Hindle Transformer Co., Inc., Flemington, N. J.
Kulka Electric Mfg. Co., Mt., Vernon, N. Y.
Packard Electric Div., General Motors Corp., Warren, O.

WRAP, PIPE

Canvas Products Co., St. Louis, Mo.
Glass Fibers, Inc., Toledo, O.
Minnesota Mining & Mfg. Co., St. Paul, Minn.
Tapecoat Co., The, Evanston, Ill.

WRENCHES, CHAIN

Armstrong Bros. Tool Co., Chicago, Ill.
Blackhawk Mfg. Co., Milwaukee, Wis.
Chicago Specialty Mfg. Co., Chicago, Ill.
Erie Tool Wks., Erie, Pa.
Reed Mfg. Co., Erie, Pa.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.

WRENCHES, PIPE

American Machine Wks., Inc., Racine, Wis.
Ampco Metal, Inc., Milwaukee, Wis.
Armstrong Bros. Tool Co., Chicago, Ill.
Austin Corp., Robert, Boston, Mass.
Billings & Spencer Co., Hartford, Conn.
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Capewell Mfg., Hartford, Conn.
Clark Bros. Mfg. Co., Hillsboro, Ore.
Erie Tool Works, Erie, Pa.
Fairmount Tool & Forging, Cleveland, O.
Frontier Bronze Corp., Niagara Falls, N. Y.
International Forge Co., Chicago, Ill.
Lowell Wrench Co., Worcester, Mass.
Lurie & Lurie, Chicago, Ill.
Nobel & Brienholt, Salt Lake City, Utah
Nye Tool Co., Chicago, Ill.
Palcoseal Mfg. Co., Ltd., Massena, N. Y.
Peck, Stow & Wilcox Co., Southington, Conn.
Ridge Tool Co., Elyria, O.
Roddick Tool Co., Anaheim, Calif.
Sac Tool Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Talon Tools, Inc., North Arlington, N. J.
Toledo Pipe Threading Machine Co., Toledo, O.
Trimont Mfg. Co., Div. of Aetna Industrial Corp., Boston, Mass.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.
Walworth Co., New York, N. Y.

WRENCHES, PIPE, REPLACEABLE JAW

Blackhawk Mfg. Co., Milwaukee, Wis.
Erie Tool Wks., Erie, Pa.
International Forge Co., Chicago, Ill.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.

WRENCHES, RATCHET

Armstrong Bros. Tool Co., Chicago, Ill.
Billings & Spencer Co., Hartford, Conn.
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Duro Metal Products Co., Chicago, Ill.
Greene, Tweed & Co., North Wales, Pa.
J O Mfg. Co., South Gate, Calif.
Lowell Wrench Co., Worcester, Mass.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp., Kenosha, Wis.
Tubing Appliance Co., Inc., Los Angeles, Calif.
William & Co., J. H., Buffalo, N. Y.

WRENCHES, TORQUE INDICATING

Ammco Tools, Inc., North Chicago, Ill.
Armstrong Bros. Tool Co., Chicago, Ill.
Blackhawk Mfg. Co., Milwaukee, Wis.
Bonney Forge & Tool Works, Allentown, Pa.
Duro Metal Products Co., Chicago, Ill.
J O Mfg. Co., South Gate, Calif.
Kent-Moore Organization, Inc., Detroit, Mich.
Richmont, Inc., Monrovia, Calif.
Sac Tool Mfg. Co., St. Louis, Mo.
Snap-on Tools Corp, Kenosha, Wis.
Sturtevant Co., P. A., Addison, Ill.
Williams & Co., J. H., Buffalo, N. Y.

X-RAY MACHINES AND FILM

See Machines and Film, X-Ray

ZONE CONTROLS

See Systems, Heating, Zone Control

DIRECTORY SECTION
HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRY AND LARGE BUILDINGS
PART 3—ALL TRADE NAMES

A-B—Motor controllers. Allen-Bradley Co., Milwaukee, Wis.
ABC—Dehumidifiers, humidifiers, dust collectors, unit coolers. American Blower Corp., Detroit, Mich.
A-C—Water treatment. Elgin Softener Corp., Elgin, Ill.
ACB—Coatings. Tropical Paint & Oil Co., Cleveland, O.
A/C Range—Filters. American Air Filter Co., Inc., Louisville, Ky.
A & R—Dehumidifiers. Air & Refrigeration Corp., New York, N. Y.
ARRC—Couplings, fittings, flanges, unions. Union Metal Wks., Chelsea, Mass.
ASBO—Ventilators, louvers and shutters. American Steel Band Co., Pittsburgh, Pa.
ASME—Regulators. Bell & Gossett Co. Morton Grove, Ill.
AUS Mun—Air conditioning units. Austin Engrg. & Mfg. Co., Inc., Ysleta, Tex.
Abco—Water heaters. Riverside Boiler & Engrg. Co., Inc., Ft. Worth, Tex.
Abrasoweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Abso-Lute—Cement and compounds. Key Co., East St. Louis, Ill.
Absolute—Air filters. Cambridge Filter Corp., Syracuse, N. Y.
Accordion—Insulation. Infra Insulation, Inc., New York, N. Y.
Ace—Dampers. Martens & Stormoen, West Quincy, Mass.
Ace—Fittings, pipe, protective coatings, pumps, tanks, valve. American Hard Rubber Co., New York, N. Y.
Ace—Welders. Peer, Inc., Benton Harbor.
Ace-Flex—Plastic tubing. American Hard Rubber Co., New York, N. Y.
Ace-Saran—Plastic tubing. American Hard Rubber Co., New York, N. Y.
Acid Causticbond Tank Lining System—Linings. Wilbur & Williams Co., Brighton, Mass.
Ackerock—Tank linings. Acker Organization, Inc., W. M., Meridian, Miss.
Acolite—Enamels and lacquers. Acorn Refining Co., Cleveland, O.
Acousteel—Insulation. Celotex Corp., The, Chicago, Ill.
Acousti-Celotex—Insulation. Celotex Corp., The, Chicago, Ill.
Acoustilite—Insulation. Insulite Co., Minneapolis, Minn.
Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Acro—Gages, regulators. Air Conversion Research Corp., Chicago, Ill.
Acrowrap—Insulation. Owens-Corning Fiberglas Corp., Toledo, O.
Acusti-Luminus—Panels. Luminous Ceilings, Inc., Chicago, Ill.
Actex—Heat exchangers. Wabash Corp., Chicago, Ill.
Adacast—Refractories. Botfield Refractories Co., Philadelphia, Pa.
Adamant—Furnace cement. Botfield Refractories Co., Philadelphia, Pa.
Adapatch—Refractories. Botfield Refractories Co., Philadelphia, Pa.
Adapto—Furnaces. Mammoth Furnace Co., St. Paul, Minn.
Adastic—Insulating cement. Botfield Refractories Co., Philadelphia, Pa.
Adjust-O-Feeder—Feeders, pumps, water treatment. Proportioneers, Inc., Div. of B-I-F- Industries, Inc. Providence, R. I.
Adjustor—Heating systems. The Kehm Corp., Chicago, Ill.
Adsco—Coils, regulators, oil coolers, exchangers, heaters, joints, meters, pipe hangers and supports, pipe protectors, separators, sight glasses, strainers. American District Steam Co., Inc., North Towanawanda, N. Y.
Adsco Dual—Traps. American District Steam Co., Inc., North Tonawanda, N. Y.
Adsco Rotary—Condensation meters. American District Steam Co., Inc., North Tonawanda, N. Y.
Aemco—Relays, switches. Automatic Electric Mfg. Co., Mankato, Minn.
Aeracool—Blades, fans, louvers and shutters. Myers Electric Co., Inc., Pittsburgh, Pa.
Aerisweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Aero—Roof ventilators. Jordan & Co., Paul R., Indianapolis, Ind.
Aero—Aftercoolers, heat exchangers. Niagara Blower Co., New York, N. Y.
Aero—Radiation. National Radiator Co., The, Johnstown, Pa.
Aerodyne—Fans. Jeffrey Mfg. Co., Columbus, O.
Aerodyne—Collectors. Green Fuel Economizer Co., Beacon, N. Y.
Aerofuse—Air diffusers. Tuttle & Bailey, Inc., New Britain, Conn.
Aerolux—Air conditioning units. Johnson Co., S. T., Bridgeport, Pa.
Aeromaster—Propeller fans, blades. Koppers Company, Inc., Baltimore, Md.
Aeromatic Exhauster—Ventilators. Octagon Ventilator Co., Chicago, Ill.
Aeropass—Condensers. Niagara Blower Co., New York, N. Y.
Aeropel—Ventilators. American Blower Corp., Detroit, Mich.
Aeroplane—Roof ventilators. Jordan & Co., Paul R., Indianapolis, Ind.
Aeroplex—Fans. Bayley Blower Co., Milwaukee, Wis.
Aeropull—Roof ventilators. Jordan & Co., Paul R., Indianapolis, Ind.
Aero Seal—Packing. Chicago Belting Co., Chicago, Ill.
Aerosolve—Air filters. Cambridge Filter Corp., Syracuse, N. Y.
Aerospot—Fans. South Bend Air Products, Inc., South Bend, Ind.
Aerovane—Anemometers. Friez Instrument Div., Bendix Aviation Corp., Baltimore, Md.
Aerovane—Grilles, registers. Tuttle & Bailey, Inc., New Britain, Conn.
Aertite—Boiler & tank insulation. Johns-Manville, New York, N. Y.
Afco—Heaters. American Furnace Co., St. Louis, Mo.
Affco—Louvers and shutters. American Foundry & Furnace Co., Bloomington, Ill.
Agastat—Electrical relays. A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N.J.
Agaswitch—Time switches. A'G'A Div. of Elastic Stop Nut Corp. of America, Elizabeth, N.J.
Agilene—Fittings, fans, sheets, duct and duct fittings, pipe, tubing, valves. American Agile Corp., Bedford, O.
Agilide—Duct and duct fittings, fans, sheets, pipe, valves. American Agile Corp., Bedford, O.
Agitair—Air diffusers, filters, heaters, meters, ventilators. Air Devices, Inc., New York.
Airacoustic—Insulation. Johns-Manville, New York, N. Y.
Air-aid—Compounds. Lord & Clark Co., Inc., Boston, Mass.
Air Cell—Asbestos insulation. Keasbey & Mattison Co., Ambler, Pa.
Aircell Board—Insulation, Sheets. Norristown Magnesia & Asbestos Co., Norristown, Pa.
Airco—Arc welders, welding rod, solder, pipe cutting machines, torches. Air Reduction Sales Co., New York, N. Y.
Air Control—Fans, heaters, unit air conditioners. Hastings Air Conditioning Co., Hastings, Neb.
Aircon—Condensers. McQuay, Inc., Minneapolis, Minn.
Air-Con—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Aircoustat—Duct insulation. Industrial Sound Control, Inc., Hartford, Conn.
Airditioner—Air conditioning units. Modine Mfg. Co., Racine, Wis.
Airefiner—Water treatment. Oakite Products, Inc., New York, N. Y.
Airfuge—Separators. Swartwout Co., The, Cleveland, O.
Aire-Rectifier—Coolers. Lintern Corp., Painesville, O.
Airette—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.
Airex—Air washers, fans, unit air conditioners, ventilators. Mountain States Equipment Co., Denver, Colo.
Airflex—Couplings. Falk Corp., Milwaukee.
Air-flo—Louvers and shutters. Air Conditioning Products Co., Detroit, Mich.
Air Flow—Registers. The Louvra Corp., Union, N. J.
Airfoil—Fans, fan blades, ventilators. Aerovent Fan Co., Inc., Piqua, O.
Airfoil—Dampers, diffusers, grilles, registers. Titus Mfg. Corp., Waterloo, Ia.
Airgraph—Thermometers. Hausman Mfg. & Sales Co., Chicago, Ill.
Airguide—Hygrometers, indicators, thermometers. Airguide Instrument Co., Chicago, Ill.
Air Guide—Vanes. Titus Mfg. Corp. Waterloo, Ia.
Air Guide — Radiation. Rempe Co., Chicago.
Airid—Valves. Quality Specialty Co., Inc., Camden, N. J.
Airistrocrat—Fan blades. Torrington Mfg. Co., Torrington, Conn.
Airjector—Ventilators. Swartwout Co., Cleveland, O.
Airlift—Ventilators. Swartwout Co., Cleve-
Air Line—Motors. Brock-Brockmeyer Co., Inc., Dayton, O.
Airliner—Fan blades, and fans. Burden Co., Alan E., Los Angeles, Calif.
Airlouver—Louvers and shutters. Swartwout Co., Cleveland, O.
Airmaster—Dehumidifiers. Haertel Co., Walter, Minneapolis, Minn.
Airmat Arrester—Dust collectors. American Air Filter Co., Inc., Louisville, Ky.
Airmat Drifilter—Filters. Airgard Mfg. Co. Chicago, Ill.
Air-Max—Dampers, diffusers, fans, unit heaters, ventilators. Gallaher Co., The, Omaha, Neb. & Owatonna, Minn.
Air Meter—Air velocity meters. Hastings Instrument Co., Inc., Warwick, Va.
Airmover—Ventilators. Swartwout Co., Cleveland, O.
Airocool—Air conditioning units. Mefco Mfg. Co., Air Cond. Div., Glendale, Calif.
Airocool—Burners. National Airoil Burner Co., Inc., Philadelphia, Pa.
Airo-Flex—Registers. Auer Register Co., Cleveland, O.
Airoflo—Ventilators. Mefco Mfg. Co., Air Conditioning Div., Glendale, Calif.
Airfoil—Registers, scoops, grilles, dampers, diffusers. Titus Mfg. Corp., Waterloo, Ia.
Airoil—Oil burners. National Airoil Burner Co., Inc., Philadelphia, Pa.
Air-O-Line—Pumps, valves. Beckett & Co., Inc., Thomas, Dallas, Tex.
Air-O-Matic—Air conditioning units. Williams Div., Eureka Williams Corp., Div. of Henney Motor Co., Inc., Bloomington, Ill.
Airotor—Blower wheels. Torrington Mfg. Co., Torrington, Conn.
Airout—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.
Air-O-Vane—Diffusers. Krueger Air Conditioning Co., Tucson, Ariz.
Airovent—Gas Burners. National Airoil Burner Co., Inc., Philadelphia, Pa.
Airpak—Filters. Conoflow Corp., Philadelphia.
Airphlo—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Air Prover—Regulators. A-P Controls Corp., Milwaukee, Wis.
Air Pure—Air filters. Flanders Mill, Inc., Riverhead, Long Island, N. Y.
Air Rad—Radiation. Penn Boiler & Burner Corp., Lancaster, Pa.
Airsan—Filters. Air Filter Corp., Milwaukee.
Air-Scoop—Eliminators. Taco Heaters, Inc. Cranston, R. I.
Airstat — Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Airswitch—Thermostats, regulators. Minneapolis-Honeywell Regulator Co., Minneapolis.
Airtrol—Air eliminators. Bell & Gossett Co., Morton Grove, Ill.
Airtron—Ducts and duct fittings, hose, insulation. Arrowhead Rubber Co., Long Beach, Calif.
Air-Tumbler—Dust collectors. Dust Suppression & Engineering Co., Lake Orion, Mich.
Airturn—Duct turning vanes. Barber-Colman Co., Rockford, Ill.
Airvalve—Ventilators. Swartwout Co., Cleveland, O.
Air-Van—Ventilators, exhausters, fans. Gallaher Co., The, Owatonna, Minn. & Omaha, Neb.
Air-Wave—Fans. Trade-Wind Motorfans, Inc., Los Angeles, Calif.
Air-X-it—Roof ventilators. Octagon Ventilator Co., Chicago, Ill
Airxpel—Traps. Wright-Austin Co., Detroit.

Airxpeler—Roof ventilators, dampers, fittings, hose, exhausters, centrifugal fans, louvers and shutters, vent flue caps. Ammerman Co., G. L., Minneapolis, Minn.
Ajax—Gaskets, United States Gasket Co., Camden, N. J.
Akon—Water treatment. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Aktiv—Cleaning compounds. Turco Products, Inc., Los Angeles, Calif.
Alcalex—Water softeners. Research Products Corp., Madison, Wis.
Alcoa—Angles, compounds, rods, dehydrators, electrodes, exchangers, pipe, sheets, tanks, tubing. Aluminum Co. of America, Pittsburgh, Pa.
Alcuplate—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Alen—Units, washers. Comfort Products Corp., Dallas, Tex.
Alfol—Insulation. Reflectal Corp., Subsid., Borg.-Warner Corp., Chicago, Ill.
Algaecide—Water treatment Anderson Chemical Co., Inc., Macon, Ga.
Algaecide—Water treatment. Western Chemical Co., Kansas City, Mo.
Alkasteem—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.
Alkyd—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.
All Blow—Fans. Trade Wind Motorfans, Inc., Rivera, Calif.
Allencote—Refractories and refractory cement. Allen Co., Robert G., Mechanicsville, N. Y.
Allenite—Soot destroyers. Allen Co., Robert G., Mechanicsville, N. Y.
All-In-One—Regulators. Bell & Gossett Co., Morton Grove, Ill.
All-Metl—Vibration isolating bases and pads. Barry Corp., Watertown, Mass.
Allmul—Refractories and refractory cement. Babcock & Wilcox Co., New York, N. Y.
All Purpose—Grilles. Louvra Corp., The, Union, N. J.
Allspeed Selector—Mechanical changers. Worthington Corp., Harrison, N. J.
All-State—Electrodes, welding rod rings. All-State Welding Alloys Co., Inc., White Plains, N. Y.
All-Tite—Vanes. Elgen Mfg. Corp., Long Island City, N. Y.
Alnifer—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Alnor—Anemometers, indicator controllers, thermometers. Illinois Testing Laboratories, Inc., Chicago, Ill.
Alodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Aloyco—Pipe, tubing, valves. Alloy Steel Products Co., Linden, N. J.
Alpine—Air conditioning units. International Metal Products Co., Phoenix, Ariz.
Allprene—Gaskets. Chicago Gasket Co., Chicago, Ill.
Alsiplate—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Alternarc—Arc welders. Electric Arc, Inc., Newark, N. J.
Alumattic—Louvers and shutters. Phil Rich Fan Mfg. Co., Houston, Tex.
Alumaweld—Solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Aluminweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Alumiseal—Insulation. Hogan & Co., Inc., C. T., New York, N. Y.
A-Lum-O—Filters. Bard Mfg. Co., Bryan, O.
A-Lum-O-Aire—Filters. Carey Electronic Engineering Co., Metal Wool Div., Springfield, O.
Alundum—Grinders and grinding wheels. Norton Co., Worcester, Mass.
Always Reliable—Benders, cutters, torches, wrenches. Bernz Co., Otto, Rochester, N. Y.
Amblerex—Insulating cement. Keasbey & Mattison Co., Ambler, Pa.
Amco—Protective coatings. American Solder & Flux Co., Philadelphia, Pa.
Amco—Humidifiers. Grinnell Co., Inc., Providence, R. I.
Amco—Control Systems, humidifiers, hygrometers indicators, meters, nozzles, tanks, air conditioning units, psychrometers, valves. American Moistening Co., Providence, R. I.
Amcoil—Radiation, cooling and heating surfaces. American Coils Co., Newark, N. J.
Amer-glas—Air filters. Bowman Co., D. F., New Albany, Ind.
Amer-glas—Unit filters. American Air Filter Co., Inc., Louisville, Ky.
American—Absorbers, metal hose, tubing. American Metal Hose Branch, American Brass Co., The, Waterbury, Conn.
American—Couplings. American Flexible Coupling Co., Erie, Pa.
American—Furnaces, heaters. American Foundry & Furnace Co., Bloomington, Ill.
American—Recorders, hygrometers, indicator-controllers, manometers, regulators, recorder-controllers, thermometers, transmitters, wells. Manning, Maxwell & Moore, Inc., Stratford, Conn.
American—Meters. American Meter Co., Inc., Philadelphia, Pa.
American—Speed reducers. American Pulley Co., Philadelphia, Pa.
American—Pumps, softeners, water filters, water treatment. American Well Works, Aurora, Ill.
American—Pipe benders. American Pipe Bending Machine Co., Inc., Poultney, Vt.
American—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
American—Meters. Buffalo Meter Co., Buffalo, N. Y.
American Empire—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh.
American Exbrook—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh.
American Hammered—Rings. Koppers Company, Inc., Metal Products Div., Baltimore.
American H/V—Unit Filters. American Air Filter Co., Inc., Louisville, Ky.
American-Microsen — Transmitters. Manning, Maxwell & Moore, Inc., Stratford, Conn.
American Redflash—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh.
American Standard—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh.
American Superfin—Heaters. American Foundry & Furnace Co., Bloomington, Ill.
American Water Tube—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Amerigear—Couplings. American Flexible Coupling Co., Erie, Pa.
Ameritherm—Heaters, air conditioning units. American Thermal Industries, Inc., Detroit.
Amerjet—Collectors. American Air Filter Co., Inc., Louisville, Ky.
Ames—Pumps. Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Amesteam—Boilers. Ames Iron Works, Inc., Oswego, N. Y.
Aminco—Calorimeters, gage testers, indicator-controllers, indicators, pumps, recorders, regulators, relays, viscosimeters. American Instrument Co., Inc., Silver Spring, Md.
Ammonoduct—Pipe. Bethlehem Steel Co., Bethlehem, Pa.
Ampcoflex—Pipe fittings, fume disposal hoods, plastic valves. Atlas Mineral Products Co., Mertztown, Pa.
Am-Pe-Co—Centrifugal fans. American Machine Products Co., Marshalltown, Ia.
Amphesive—Adhesives. Atlas Mineral Products Co., Mertztown, Pa.
Amtico—Heaters, air conditioning units. American Thermal Industries, Inc., Detroit.
Anco—Water treatment. Anderson Chemical Co., Inc., Macon, Ga.
Anco Condenser Cleaner—Compounds, scale removal. Anderson Chemical Co., Inc., Macon, Ga.
Anaconda—Fitting, pipe, welding rod, sheets, solder, tubing, valves. American Brass Co., Waterbury, Conn.
Anemotherm—Direct reading meters, Anemostat Corp. of America, New York, N. Y.
Ankorite—Packing. Anchor Packing Co., Philadelphia, Pa.
Anthracite 1600—Water heaters. Catskill Metal Works, Inc., Catskill, N. Y.
Anti-Spatter—Welding compounds. Wolfe-Kote Co., Inc., Sheboygan, Wis.
Apco—Turbine type pumps, systems. Aurora Pump Co., Aurora, Ill.
Apeco—Blueprint machines. American Photocopy Equipment Co., Chicago, Ill.
Apex—Analyzers, recorders, indicators. Uehling Instrument Co., Paterson, N. J.
Apexior—Coatings. Dampney Co., The, Boston, Mass.
Aprilaire—Humidifiers. Research Products Corp., Madison, Wis.
Apsco—Switches. April Showers Co., Inc., Washington, D. C.
Aptco—Wrenches. Nobel & Brienholt, Salt Lake City, Utah.
Apthorp—Nozzles. Boston Machine Works, Inc., Lynn, Mass.
Aqua-Clear—Water treatment. Sudbury Laboratory, South Sudbury, Mass.
AquaHeater—Heaters. Lewis & Co., Joseph E., Baltimore, Md.
Aqualator—Circulators. Triplex Heating Specialty Co., Inc., Peru, Ind.
Aqua-Matic—Heaters. Heat Equipment, Not Inc., Chicago, Ill.
Aquamizer—Condensers. Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Aquastat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Aqua-Tite—Seals. Schwitzer-Cummins Co., Indianapolis, Ind.
Aquatone—Treatment, steam and water. Ampion Corp., Long Island City, N. Y.
Aquatower—Cooling towers. Marley Co., The, Kansas City, Mo.
Aqulux—Heaters. Johnson Co., S. T., Bridgeport, Pa.
Arbest—Flanges, hangers, humidifiers, nipples, plates, valves. G & H Mfg. Co., Philadelphia, Pa.
Arc-Eng—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Arco—Hangers, radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Arcoliner—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Arco Sil—Hose. Arrowhead Rubber Co., Long Beach, Calif.
Arctic Circle—Air conditioning units. International Metal Products Co., Phoenix, Ariz.
Arex-Austor—Roof ventilators. Arex Co., Chicago, Ill.
Arid Air—Dehumidifiers. Tamms Industries, Inc., Chicago, Ill.
Arin—Louvers and shutters. Arex Co., Chicago, Ill.
Armaloy—Wrenches. Armstrong Bros. Tool Co., Chicago, Ill.
Armorak—Insulation. Keasbey Co., Robert A., New York, N. Y.
Armourflow—Flexible hose. Newage International, Inc., New York, N. Y.
Armourvin—Flexible hose. Newage International, Inc., New York, N. Y.
Armstrong-Bridgeport—Benders, chasers, cutters, pipe cutting oil, reamers, stands, stocks and dies, taps, tools, vises, and wrenches. Capewell Mfg. Co., Hartford, Conn.
Aroclor—Heat transfer oil. Monsanto Chemical Co., St. Louis, Mo.
Arrow-Line—Heaters. Bastian-Morley Co., Inc., La Porte, Ind.
Arrowtrol—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Art—Direct radiation. The National Radiator Co., Johnstown, Pa.
Artcraft—Air heaters. Chicago Steel Furnace Co., Chicago, Ill.
Artic—Refrigerant. E. I. du Pont de Nemours & Co., Wilmington, Del.
Asbestocel—Boiler, tank & pipe insulation. Johns-Manville, New York, N. Y.
Asbestocite—Boiler & tank insulation. Johns-Manville, New York, N. Y.
Asco—Valves, relays, switches, panel and control boards. Automatic Switch Co., Orange, N. J.
Ashcroft—Gages, cocks, recorders, testers, transmitters. Manning, Maxwell & Moore, Inc., Stratford, Conn.
Aspir-Jet—Nozzles. Thermal Agency, Houston, Tex.
At-a-Glance—Gages. Krueger Sentry Gauge Co., Green Bay, Wis.
Athol—Fittings, unions. Leavitt Machine Co., Orange, Mass.
Atlas—Paint. Foster Co., Benjamin, Philadelphia, Pa.
Atlas—Fans, furnaces, heaters. International Sales Co., San Francisco, Calif.
Atomick—Humidifiers, nozzles. Maid-O'-Mist, Inc., Chicago, Ill.
Atomist—Humidifiers. American Foundry & Furnace Co., Bloomington, Ill.
AutofyrStop—Systems. Merchant & Evans Co., Philadelphia, Pa.
Autographs—Nameplate parts. Metalcraft Inc., Mason City, Ia.
Auto-Klean—Filters, strainers. Cuno Engineering Corp., Meriden, Conn.
Autolec—Generators. Orr & Sembower, Inc., Reading, Pa.
Autolite—Motors, wire, recorders, thermometers. Electric Autolite Co., Instrument & Gauge Div., Toledo, O.
Autolube—Bearings. International Powder Metallurgy, Inc., Ridgway, Pa.
Automaze—Filters. Air-Maze Corp., Cleveland, O.
Autovent—Eliminators, humidifiers, valves. Maid-O'-Mist, Inc., Chicago, Ill.
Autronic—Recorders, indicator-controllers, meters, recorder-controllers. Swartwout Co., Cleveland, Ohio.
Axiflo—Fans. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Axivane—Blowers. Joy Mfg. Co., Pittsburgh.

B.A.C.—Condensers, oil coolers, cooling towers. Baltimore Aircoil Co., Inc., Baltimore, Md.
B. B.—Blast gates. Berger Bros. Co., Philadelphia, Pa.
B & B—Heating and air conditioning equipment. Bishop & Babcock Mfg. Co., Cleveland, O.
B & C—Plates, valves, unions. Beaton & Corbin Mfg. Co., Southington, Conn.
BCA—Bearings. Bearings Co. of America, Lancaster, Pa.
B. & G.—Air eliminators, circulators, coolers, condensers, fittings, heat exchangers, heaters, heating systems, temperature regulators, tanks, valves. Bell & Gossett Co., Morton Grove, Ill.
B-H—Insulation. Baldwin-Hill Co., Trenton, N. J.
B-H—Insulating cement, pipe insulation. Baldwin-Hill Co., Trenton, N. J.
B-H No. 1 Powerhouse—Insulation. Baldwin-Hill Co., Trenton, N. J.
B & J—Orifices, strainers, systems, traps, valves. Barnes & Jones, Inc., Boston.
B & K—Pipe cutting and threading machines. Bignall & Keeler, Div., John Ramming Machine Co., St. Louis, Mo.

B-Line—Electric motors. Brown-Brockmeyer Co., Inc., Dayton, O.
B.O.—Cocks, joints, valves. Bordo Co., Inc., L. J., Glenside, Pa.
B & P Enamel—Enamels and lacquers. Tropical Paint & Oil Co., Cleveland, O.
BU—Couplings. Dahl, G. W., Bristol, R. I.
B & W—Boilers, burners, desuperheaters, fuel economizers, refractories, stokers, superheaters. Babcock & Wilcox Co., New York, N. Y.
B & W—Pipes, tubes, and tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
B & W—Tubing. Babcock & Wilcox Co., The, Tubular Products Div., Alliance, O.
Bacite—Insulation. Bird-Archer Co., Philadelphia, Pa.
Baco—Soot destroyer, pumps. Bird-Archer Co., Philadelphia, Pa.
Badger—Time switches. Reliance Automatic Lighting Co., Racine, Wis.
Baflex—Enamels and lacquers, protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.
Balance-trol—Heating systems. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Ball Bushings—Ball bearings. Thomson Industries, Inc., Manhasset, N. Y.
Ball-Rite—Drills. Oster Mfg. Co., John, Milwaukee, Wis.
Balsam-Wool—Insulation. Wood Conversion Co., St. Paul, Minn.
Bankheat—Oil burners. Johnson Co., S. T., Bridgeport, Pa.
Banroc—Pipe insulation. Johns-Manville, New York, N. Y.
Bantam—Valves. Dahl, G. W., Bristol, R. I.
Bantam—Pumps. Gelber Co., Samuel S., Chicago, Ill.
Barcol—Motors, operators. Barber-Colman Co., Rockford, Ill.
Barnes—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.
Barnes—Cutters. Erie Tool Works, Erie, Pa.
Bar-O-X—Protective coatings. Truscon Laboratories, Detroit, Mich.
Barreled Sunlight—Enamels. U.S. Gutta Percha Paint Co., Providence, R. I.
Barry—Bearings, pulleys and sheaves. Dick Co., Inc., R. & J., Passaic, N. J.
Barton-American—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
Base Ray—Baseboard radiation. Burnham Corp., Irvington, N. Y.
Basifrit—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Baso—Valves. Milwaukee Gas Specialty Co., Milwaukee, Wis.
Bate—Soot blowers. General Blower Co., Philadelphia, Pa.
Bay State—Enamels and lacquers. Devoe & Reynolds Co., Inc., New York, N. Y.
Bazooka—Torches. Deutsch Co., The, Los Angeles, Calif.
Beacor—Valves. Beaton & Corbin Mfg. Co., Southington, Conn.
Beaverkill—Leather belting and v-belts. Baldwin Belting, Inc., New York, N. Y.
Beco-Cell—Corrosion treatment, scale removal. Brown Electro Co., Oklahoma City, Okla.
Bel-Air—Valves. Bellows Co., The, Akron, Ohio.
Belco—Fans, louvers and shutters. Belco Industries, Inc., St. Louis, Mo.
Bell-Pack—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Belmont—Gages, regulators, electrical relays. Thermo Instruments Co., Belmont, Calif.
Beloit—Machines, punches, power shears. Hendley & Whittemore Co., Beloit, Wis.
Berkshire—Hangers and supports. Armart Mfg. Co., Pittsfield, Mass.
Bermico—Fiber glass. Brown Co., Boston, Mass.
Bestfelt "Lamino Sponge"—Insulation. Keasley & Mattison Co., Ambler, Pa.
Bestoil—Pipe oil. Oster Mfg. Co., Cleveland, O.
Beth-Co-Weld—Pipe. Bethlehem Steel Co., Bethlehem, Pa.
Beth-Cu-Loy—Sheets. Bethlehem Steel Co., Bethlehem, Pa.
Bi-Air—Burners. John Zink Co., Tulsa.
Bifurcator—Fans. DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Big Dope—Cement and compounds. Dragert Co., Inc., C. H., Dallas, Tex.
Bildrite—Insulation. Insulite Co., Minneapolis, Minn.
Biltin—Heaters. Taco Heaters, Inc., Cranston, R. I.
Bi-Mix—Burners. John Zink Co., Tulsa, Okla.
Binoc—Thermometers. Taylor Instrument Companies, Rochester, N. Y.
Bison—Boilers. Farrar & Trefts, Buffalo, N. Y.
Bitumastic—Protective coatings. Koppers Co., Inc., Pittsburgh, Pa.
Bituminous—Bases and pads. Celotex Corp., The, Chicago, Ill.
Bituminous—Coatings. Robertson Co., H. H., Pittsburgh, Pa.
Bituplastic—Coatings. Koppers Co., Inc., Pittsburgh, Pa.
Black Baking Japans—Enamels and lacquers. Hilo Varnish Co., Brooklyn, N. Y.
Black-Buty—Plastic pipe and tubing. Anesite Co., Chicago, Ill.
Black Magic—Cement and compounds. Bowser, Inc., Fort Wayne, Ind.
Black-Poly—Plastic pipe and tubing. Anesite Co., Chicago, Ill.
Blazecrete—Refractories. Johns-Manville, New York, N. Y.
Bloapco—Dust collectors. Blower Application Co., Milwaukee, Wis.
Blo-Cold—Unit coolers. Acme Industries, Inc., Jackson, Mich.
Bloflex—Hose. Flexaust Co., New York, N. Y.
Bluebonnet—Air conditioning units. Forston Co., Houston, Texas
Blu-Cold—Compressors. Lehigh Mfg. Co., Div. of Lehigh Foundries, Inc., Lancaster, Pa.
Blu-Flame—Burners, heaters. Vacuum Gas Burner, Olean, N. Y.
Blue Circle—Heating boilers. Dunkirk Radiator Corp., Dunkirk, N. Y.
Blueknight—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Blue-Point—Cutters, Tools, wrenches. Snap-on Tools Corp., Kenosha, Wis.
Blue Ribbon—Headers and nipples. Chicago Nipple Mfg. Co., Cicero, Ill.
Blue Streak—Dehydrators. Wabash Corp., Chicago, Ill.
Boardman—Pump governors. Locke Regulator Co., Salem, Mass.
Bob—Float valves. Robert Mfg. Co., Los Angeles, Calif.
Boilergard—Low water cut-offs. Maid-O'-Mist, Inc., Chicago, Ill.
Boiler-Lox—Compounds. Radiator Specialty Co., Charlotte, N. C.
Boiler Solder Seal—Compounds. Radiator Specialty Co., Charlotte, N. Carolina.
Bolt-O-Seal—Gaskets. Wolfe Co., Inc., Franklin C., The, Culver City, Calif.
Bondwich—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Borgana—Compounds, treatments. Strong, Carlisle & Hammond Co., Cleveland, O.
Bosco—Clay pipe. Bowerston Shale Co., The, Bowerston, O.
Boston-Standard—Draft controls. Boston Machine Works Co., Lynn, Mass.
Brad-Ray—Radiant heating coils and panels. Carlon Products Corp., Cleveland, O.
Branford—Oil burners, unions. Malleable Iron Fittings Co., Branford, Conn.
Brassweld—Compounds. Sight Feed Generator Co., West Alexandria, O.
Braxon—Compounds, scale removal, water treatment. Anderson Chemical Co., Inc., Macon, Ga.
Brazaloy—Solder. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Brazo—Solder. Linde Air Products Co., The, Unit of Union Carbide & Carbon Corp., New York, N. Y.
Breeze Master—Fans. Acme Equipment Co., Muskogee, Okla.
Breezo—Fans. Buffalo Forge Co., Buffalo, N. Y.
Breezy-Air—Air conditioning units. Barwick Mfg. Corp., Wichita, Kan.
Brikset—Cement. Chicago Fire Brick Co., Chicago, Ill.
Brillant Fire—Heaters. Ohio Foundry & Mfg. Co., Steubenville, O.
Bronco—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
Bronzende—Electrodes. Arcos Corp., Philadelphia, Pa.
Bronzeweld—Compounds. Sight Feed Generator Co., West Alexandria, O.
Brooklyn—Adhesive tape. Johns-Manville, New York, N. Y.
Brown-Heet—Heaters. Brown Products Co., Forest Hills, N. Y.
Brule—Incinerators. Goder Incinerator Corp., Chicago, Ill.
BTUnit—Unit heaters. Industrial Mfg. & Engineering Co., Chicago, Ill.
Budget—Water heaters. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Buildrite—Insulation. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis.
Bulator—Grilles. Hendrick Mfg. Co., Carbondale, Pa.
Bulldog—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Bulldog—Bolts, drills. Polis Mfg. Co., J. D., Chicago, Ill.
Bulldog—Shears and snips. Wiss & Sons Co., J., Newark, N. J.
Bull Dog—Stocks and dies. Oster Mfg. Co., Cleveland, O.
Bull Dog—Pipe and tubing. Phelps Dodge Copper Products, British American Tube Div., New York, N. Y.
Bull Dog—Pulleys and sheaves. Boston Woven Hose & Rubber Co., Cambridge, Mass.
Bull Dog—Valves. The Carpenter Valve Corp., Cleveland, O.
Bull's Eye—Glasses. Fischer & Porter Co., Hatboro, Pa.
Bullet—Filters. Sealed Unit Parts Co., Inc., Bronx, N. Y.
Bundyflex—Steel tubing. Everhot Products Co., Chicago, Ill.
Bundyweld—Tubes and tubing. Bundy Tubing Co., Detroit, Mich.
Bunker Hill—Fittings, pipe, sheets, solder. Northwest Lead Co., Seattle, Wash.
Burdco—Blades, fans. Burden Co., Alan E., Los Angeles, Calif.
Burks—Pumps. Decatur Pump Co., Decatur, Ill.
Burnham—Compressors, condensers, pumps. Union Steam Pump Co., Battle Creek, Mich.

CC—Treatment. Utility Laboratory, Inc., Brooklyn, N. Y.
C-E—Boilers, stokers, fuel economizers. Combustion Engineering, Inc., New York.
CE-Heatmaster—Water heaters. Combustion Engineering, Inc., New York, N. Y.
CE-Raymond—Air separators. Combustion Engineering, Inc., New York, N. Y.
CFB Super—Cement and insulation. Chicago Fire Brick Co., Chicago, Ill.
C-H—Alarms, controllers and starters, heaters, relays, regulators, switches, valves. Cutler-Hammer, Inc., Milwaukee, Wis.
C & L Hoffman—Heaters. Clayton & Lambert Mfg. Co., Louisville, Ky.
CM—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
C & M—Hangers or brackets, inserts. Carty & Moore Engineering Co., Detroit, Mich.
COM—Blowers. Wing Mfg. Co., L. J., New York, N. Y.
C & R—Regulators. Automatic Control Co., St. Paul, Minn.
CSP—Transformers. Westinghouse Electric Corp., Pittsburgh, Pa.
CW—Pipe. Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.
CWF—Chillers. Taco Heaters, Inc., Cranston, R. I.
Cablestat—Cable. Wiegand Co., Edwin L., Pittsburgh, Pa.
Cadillac-Meters. Central Station Steam Co., Detroit, Mich.
Cadman—Valves. Barrett Machine Co., Pittsburgh, Pa.
Cadwell—Pressure regulators, valves and fittings, Beaton & Cadwell Mfg. Co., New Britain, Conn.
Cafco Spray—Insulation. Columbia Acoustics & Fireproofing Co., Stanhope, N. Y.
Calco—Valves. California Brass Mfg. Co., Los Angeles, Calif.
Calktite—Cement and compounds. U. S. Stoneware Co., New York, N. Y.
Calorex—Oil burners. W. N. Best Combustion Equipment Co., Inc., Carlstadt, N. J.
Camomatic—Valves. Belco Industrial Equipment Div., Inc., Paterson, N. J.
Campbell—Regulators, controls. Fuel Reduction Corp., Chicago, Ill.
Capacilogs—Temperature recorders. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Capacitrols—Indicator - controllers. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Capillary—Air washers. Clarage Fan Co., Kalamazoo, Mich.
Capillary—Air washers, humidifiers, cooling towers, unit air conditioners. Air & Refrigeration Corp., New York, N. Y.
Capitol—Boilers, hanger or brackets, heaters, radiation. United States Radiator Corp., Detroit, Mich.
CaPlugs—Fittings. Protective Closures Co., Inc., Buffalo, N. Y.
Carbofite—Soot destroyers. Ampion Corp., Long Island City, N. Y.
Carbozite—Coatings. Ohmlac Paint & Refining Co., Long Island City, N. Y.
Careyduct—Ducts and duct fittings, insulation, non-metallic sheets, duct turning vanes. Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Cash-Acme—Heating systems, pipe strainers, regulators, valves. Cash Valve Mfg. Corp., A. W., Decatur, Ill.
Cassel—Templates. Graphic Indicator Co., Los Angeles, Calif.
Castalu—Fans, wheels. Advance Aluminum Castings Corp., Chicago, Ill.
Cast-Refract—Refractories. Quigley Co., Inc., New York, N. Y.
Catch-All—Dehydrators and filters. Sporlan Valve Co., St. Louis, Mo.
Cat's Eye—Observation ports. Ess Instrument Co., Bergenfield, N. J.
Causul—Valves. Lunkenheimer Co., Cincinnati, O.
Celeritas—Calorimeters, Daigger & Co., A., Chicago, Ill.
Cell concrete—Concrete. Dockstader, Inc., S. E., Washington, D. C.

Cell-U-Blanket—Insulation. Masonite Corp., Chicago, Ill.

Cellufoam—Insulation. Masonite Corp., Chicago, Ill.

Celoron—Couplings. Continental-Diamond Fibre Co., Newark, Del.

Cemcoat—Enamels and lacquers. Sonneborn Sons, Inc., New York, N. Y.

Cementseal—Enamels and lacquers. Acorn Refining Co., Cleveland, O.

Central Aire—Unit air conditioners. Bakeraire Corp., South Windham, Me.

Central—Conduit. Spang-Chalfant, Div. of National Supply Co., Pittsburgh, Pa.

CenTraVac—Compressors. Trane Co., The, La Crosse, Wis.

Centrifugal—Ventilators. Burt Mfg. Co., Akron, O.

Centrimax—Meters. Leeds & Northrup Co., Philadelphia, Pa.

Centripac—Packing. Johns-Manville, New York, N. Y.

Centripeller—Roof ventilators. Jordan & Co., Paul R., Indianapolis, Ind.

Century—Pipe. Keasbey & Mattison Co., Ambler, Pa.

Century—Boilers. Smith Co., Inc., H. B., The, Westfield, Mass.

Certified Climate—Air conditioning units, washers. Parks-Cramer Co., Fitchburg, Mass.

Cesco—Fittings. Columbia Engineering Service Co., Santa Rosa, Calif.

Chaco—Boiler and radiator sealing compounds. Desolvo Co., The, Pittsburgh, Pa.

Challenger—Propeller fans. Signal Electric Div. of King-Seeley Corp., Menominee, Mich.

Champion—Furnaces, heaters. National Heater Co., St. Paul, Minn.

Champion—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.

Champion—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.

Chan-L-Mounts—Bases and pads. Lord Mfg. Co., Erie, Pa.

Charg-A-Can—Refrigerants. American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif.

Chemical—Gaskets, joints, packing, couplings. United States Gasket Co., Camden, N. J.

Chem-o-Feeder—Feeders, pumps, water treatment. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Chem-O-Shot—Pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Chempac—Gaskets, packing. Johns-Manville, New York, N. Y.

Chenco—Compounds, filters, water treatment, softeners. Chemical Engineering Co., Dallas, Tex.

Chevron—Packing. Garlock Packing Co., Palmyra, N. Y.

Chicago—Brakes. Dreis & Krump Mfg. Co., Chicago, Ill.

Chicago—Bolts and drills. Chicago Expansion Bolt Co., Chicago, Ill.

Chicago—Stokers. Eddy Stoker Corp., Chicago, Ill.

Chico—Refractories. Chicago Fire Brick Co., Chicago, Ill.

Chief Thred-O-Matic—Pipe cutting machines. Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.

Chill Air—Air conditioning units, fans. National Engineerng & Mfg. Co., Sedalia, Mo.

Chill Vactor—Chillers and steam jet compressors. Croll-Reynolds Engineering Co., Inc., New York, N. Y.

Chimney Sweep—Chemical destroyers. Coughlan Co., G. N., West Orange, N. J.

Chinook—Ferrous heating surface. Bayley Blower Co., Milwaukee, Wis.

Chlorimet—Heat exchangers, fans, fittings, heaters, pipe, pumps, sheets, valves. Duriron Co., Inc., The, Dayton, O.

Chlorinizer—Chlorinators, and treatment. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Chlor-O-Feeder—Feeders, pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Chlor-O-Mite—Pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Chore Boy—Burners. Standard Fuel Engineering Co., Detroit, Mich.

Chromalox—Preheaters, dryers, indicators-controllers, heating systems, supercheaters, thermostats, unit heaters. Wiegand Co., Edwin L., Pittsburgh, Pa.

Chrome—Packing. Chicago Belting Co., Chicago, Ill.

Chrome Lock—Gaskets, tape. Products Research Co., Los Angeles, Calif.

Chromend—Electrodes. Arcos Corp., Philadelphia, Pa.

Chromix—Refractories. Quigley Co., Inc., New York, N. Y.

Chronoflo—Flow meters, gages, recorders. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Chronometer—Valves. Defender Instrument & Regulator Co., St. Louis, Mo.

Chronotherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis.

Chil-Lator—Coolers. McQuay, Inc., Minneapolis, Minn.

Cinch—Expansion bolts. National Lead Co. New York, N. Y.

Circle-Air—Convection radiation. Paley Mfg. Corp., Brooklyn, N. Y.

Circle T—Switches. Trumbull Dept., General Electric Co., Plainville, Conn.

Clair-Tex—Connections. St. Clair Rubber Co., Detroit, Mich.

Clamp-A-Leak—Pipe repair clamps. Chelsea Metal Stamping Co., New York, N. Y.

Clarco—Unit heaters. Clarage Fan Co., Kalamazoo, Mich.

Cla Rite—Filters. Croll-Reynolds Engineering Co., Inc., New York, N. Y.

Classic—Registers. Auer Register Co., Cleveland, O.

Claymont—Steel pipes. Wickwire Spencer Steel Div. of Colorado Fuel & Iron Corp., New York, N. Y.

Clean Right—Soot destroyers. General Filters, Inc., Novi, Mich.

Clear-stream—Treatment. Reynolds Shaffer Co., Detroit, Mich.

Clearview—Gages. Boston Machine Works Co., Lynn, Mass.

Clevite—Bearings. Cleveland Graphite Bronze Co., Cleveland, O.

Cliff—Boilers, water heaters. Terre Haute Boiler Works Co., Terre Haute, Ind.

Climate Changer—Unit air conditioners, unit air coolers. Trane Co., The, LaCrosse, Wis.

Climate-Lab—Test chambers. American Instrument Co., Inc., Silver Spring, Md.

Climatrol—Boilers, furnaces, heaters, fans, metallic ducts, air conditioning units. Mueller Climatrol, Milwaukee, Wis.

Climax—Governors, regulators, strainers, steam traps, valves. Black-Sivalls & Bryson, Inc., Kansas City, Mo.

Clipper—Fans. Trade-Wind Motorfans, Inc., Rivera, Calif.

Clipper—Seals. Johns-Manville, New York.

Clorodine—Boiler cleaning compounds. American Chemical Paint Co., Ambler, Pa.

Closin—Bolts. Star Expansion Bolt Co., New York, N. Y.

Cobra—Vibration absorbers, hose, tubing. DK Mfg. Co., Cobra Metal Hose Div., Chicago, Ill.

Cocheo—Belting. Williams & Son, I. B., Dover, N. H.

Coeco—Controls and dampers. Combustion Equipment Co., Silvis, Ill.

Colalloy—Couplings, nipples, pipe. Colonial Alloys Co. Metals Div., Philadelphia, Pa.

Cold Generator—Chillers. Trane Co., The, La Crosse, Wis.

Coldjet—Unit coolers, air conditioning units. Industrial Mfg. & Engineering Co., Chicago.

Cold Stream—Unit coolers. Bakeraire Corp., South Windham, Me.

Coltemp—Insulation. Badham Insulation Co., Inc., Birmingham, Ala.

Columbia—Water heaters, air conditioning units. National Steel Construction Co., Logansport, Ind.

Columbia—Odor adsorbers, air conditioning units. Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York, N. Y.

Columbia—Ventilators. E. E. Souther Iron Co., St. Louis, Mo.

Combi-Matic—Burners. Siemon Mfg. Co., Kansas City, Mo.

Combustioneer—Stokers. Steel Products Engineering Co., Springfield, O.

Comet—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.

Comfort Control—Temperature regulators. Bell & Gossett Co., Morton Grove, Ill.

Comfortaire—Air conditioning units. American Coils Co., Newark, N. J.

Comfortrol—Thermostats. Sullivan Valve & Engineering Co., Butte, Mont.

Comfostat—Thermostats. Johnson Service Co., Milwaukee, Wis.

Comico—Insulation. Columbia Acoustics & Fireproofing Co., Stanhope, N. J.

Co-Min-Co—Insulating cement. United States Mineral Wool Co., Stanhope, N. J.

Commercial-Aire—Heaters. Mammoth Furnace Co., St. Paul, Minn.

Compact—Boilers. Titusville Iron Works Co., The, Titusville, Pa.

Compacto—Furnaces. Mammoth Furnace Co., St. Paul, Mnnn.

Compass—Belting. Goodyear Tire & Rubber Co., Akron, O.

Compound Lever—Hand shears and snips. Bartlett Mfg. Co., Detroit, Mich.

Concavex—Bearings. Shafer Bearing Div. of Chain Belt Co., Downers Grove, Ill.

Conco—Boiler cleaning compounds, water treatment. Continental Products Co., Euclid, O.

Condor—Belting, v-belts, pipe. Raybestos-Manhattan, Inc., Passaic, N. J.

Condo-Vac—Vacuum pumps. Chicago Pump Co., Chicago, Ill.

Conflex—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Coni-Vane—Ventilators. Allen Cooler & Ventilator, Inc., Rochester, Mich.

Conomotors—Duct and valve operators. Conoflow Corp., Philadelphia, Pa.

Conseco—Water chillers, tube cleaners, coils, compressors, condensers, oil coolers, dryers, heat exchangers, filters, headers, water heaters, joints, preheaters, pumps, separators, superheaters, tanks. Condenser Service & Engineering Co., Inc., Hoboken, N. J.

Conservo—Towers. Aqua-Therm, Inc. Dayton, O.

Consolidated—Valves. Manning, Maxwell & Moore, Inc., Stratford, Conn.

Constellation Line—Arc welders. Trindl Products, Ltd., Chicago, Ill.

Con-Tac-Ton—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Continental—Boilers. Boiler Engineering & Supply Co., Inc., Phoenixville, Pa.

Continental—Heaters. National Steel Construction Co., Logansport, Ind.

Continuous Flow—Heating Systems. Webster & Co., Warren, Camden, N. J.

Control-by-the-Weather—Heating control. Webster & Co., Warren, Camden, N. J.

Convector—Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.

Converto—Roof ventilators. Ammerman Co., C. L., Minneapolis, Minn.

Conveyoflo—Conveyors. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Conveyor—Pulleys and Sheaves. The American Pulley Co., Philadelphia, Pa.

Cool-A-Matic—Air conditioning units. Automatic Firing Corp., St. Louis, Mo.

Coolero—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.

Coolite—Windows. Mississippi Glass Co., St. Louis, Mo.

Coolmaster—Unit coolers. Kramer Trenton Co., Trenton, N. J.

Cool Spot—Propeller fans. Signal Electric Div. of King-Seeley Corp., Menominee, Mich.

Copaltite—Cement and compounds, gaskets. National Engineering Products, Inc., Washington, D. C.

Cop-R-Loy—Sheets. Wheeling Steel Corp., Wheeling, W. Va.

Copr-fibre—Insulation. Forty-Eight Insulations, Inc., Aurora, Ill.

Copr-Tube—Fittings. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.

Copyflex—Blueprint machine. Bruning Co., Inc., Charles, Chicago, Ill.

Copymasters—Blue print machines. Peck & Harvey Mfg. Corp., Chicago, Ill.

Coravol—Corrosion treatment. Western Chemical Co., Kansas City, Mo.

Cor-In Galvanode—Electrolytic devices. Rotometals, San Francisco, Calif.

Cork-Flex—Bases and pad. Vibration Mounting., Inc., Elmhurst, N. Y.

Cork-Rib—Bases and pad. Vibration Mounting, Inc., Elmhurst, N. Y.

Cornelius—Air compressors and regulators. North Penn Co., New York, N. Y.

Corosex—Water treatment. Research Products Corp., Madison, Wis.

Corox—Heaters. Westinghouse Electric Corp., Pittsburgh, Pa.

Corrodicide—Water treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.

Corrodine—Corrosion inhibition. Metropolitan Refining Co., Inc., Long Island City, N. Y.

Corrosanti—Corrosion inhibition. Dr. Adolph Schror, East Orange, N. J.

Corruflex—Expansion joints. American District Steam Co., Inc., North Tonawanda, N. Y.

Cosmolubric—Refrigeration oil. Houghton & Co., E. F., Philadelphia, Pa.

Cotospray—Nozzles. Prichard & Co., of California, J. F., Kansas City, Mo.

Cotoid—Coatings. Lithgow Corp., Chicago.

Cottrell—Dust collectors. Research Corp., New York, N. Y.

Cottrell—Dust collectors. Western Precipitation Corp., Los Angeles, Calif.

Cox—Water heaters. O'Brien Steam Specialty Co., Inc., Syracuse, N. Y.

Coxe—Stokers. Combustion Engineering, Inc., New York, N. Y.

Co-Z-Air—Electric radiators. Conco Engineering Wks., Div. of H. D. Conkey & Co., Mendota, Ill.

Crescent—Boiler gage cocks, Wright-Austin Co., Detroit, Mich.

Crescent—Valves. Powell Co., Wm., The, Cincinnati, O.

Cresline—Plastic fittings, pipe, tubing. Crescent Plastics, Inc., Evansville, Ind.

Crest—Water heaters. Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.

Croloy—Pipe, tubes, and tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.

Cromaloy—Solder. Linde Air Products Co., The, Unit of Union Carbide & Carbon Corp., New York, N. Y.

Cross-Flo—Dehydrators. Remco, Inc., Zelienople, Pa.
Crown—Cement and compounds. Colebrook & Sons, Inc., W. H., Syracuse, N. Y.
Crystals—Enamels and lacquers. Hilo Varnish Corp., Brooklyn, N. Y.
Cummins—Drills. Oster Mfg. Co., John, Milwaukee, Wis.
Cushioned Power—Valves. White-Rogers Electric Co., St. Louis, Mo.
Customair—Air conditioning units. Trane Co., The, La Crosse, Wis.
Custom Built—Unit air conditioners. Baker Refrigeration Corp., South Windham, Me.
Cut Master—Vertical turret lathes. Bullard Co., The, Bridgeport, Conn.
Cutno—Packing. Greene, Tweed & Co., North Wales, Pa.
Cut-O-Matic—Flame cutters. National Cylinder Gas Co., Chicago, Ill.
Cuttrade—Electrodes. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Cycoil—Filters. American Air Filter Co., Louisville, Ky.
Cyclone—Exhaust heads. Wright Austin Co., Detroit, Mich.
Cyclone—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Cyclops—Roller bearings. Roller Bearing Co. of America, West Trenton, N. J.

DFN—Dehydrators, filters. McIntire Co., The, Livingston, N. J.
DH—Ball bearings. Dodge Mfg. Corp., Mishawaka, Ind.
D.I.P.—Bends, insulation, piping. Durant Insulated Pipe Co., Palo Alto, Calif.
D.I.P.—Insulation, piping. Durant International Corp., Williamstown, N. J.
D-O—Adsorbers. Research Products Corp., Madison, Wis.
D-O Kote—Adsorbers. Research Products Corp., Madison, Wis.
DRC-Blue Circle—Baseboard radiation. Dunkirk Radiator Corp., Dunkirk, N. Y.
Daptoblu—Gas burners. Beck Engineering Combustion Kompany, St. Louis, Mo.
Darcova—Packing. Sims Pump Valve Co., Hoboken, N. J.
Dart—Unions. Fairbanks Co., The, New York, N. Y.
Day-Nite Acratherm—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Day-Steel—Pulleys. Dayton Rubber Co., Dayton, O.
Dean—Cleaners. Pierce Co., Wm. B., The, Buffalo, N. Y.
Debecote—Coatings. Debevoise Co., The, Brooklyn, N. Y.
Deflectrol—Turning vanes. Barber-Colman Co., Rockford, Ill.
Defrostolator—Hot gas defrosting systems. Tenney Engineering, Inc., Union, N. J.
Dehydrators—Dehumidifiers. Selas Corp. of America, Philadelphia, Pa.
Delta—Steel boilers. Zingham Co., William C., Chicago, Ill.
Demandtrol—Valves. Sullivan Valve & Engineering Co., Butte, Mont.
Demi—Valves. Dahl, G. W., Bristol, R. I.
Demon Air-Set—Refractories. Plibrico Firebrick Co., Chicago, Ill.
Densitron—Alarms. Ripley Co., Inc., Middletown, Conn.
Deoxidine—Cleaning compounds. American Chemical Paint Co., Ambler, Pa.
Dereka—Protective coatings. Debevoise Co., The, Brooklyn, N. Y.
Desert Air—Heaters. Central States Mfg. Co., Inc., Arkansas City, Kan.
Desmond-Simplex—Pipe vises. Desmond-Stephan Mfg. Co., Urbana, O.
Desomatic—Dehumidifiers. Daly, Merritt & Sullivan, Inc., Falls Church, Va.
De-Sta-Co.—Fan housings, pipe clamps, valves. Detroit Stamping Co., Detroit, Mich.
Detect-A-Fire—Controls. Fenwal Inc., Ashland, Mass.
Detroit—Traps. Nason Co., Clarkston, Mich.
Detroit LoStoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Detroit Rotograte Stoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Detroit Rotostoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Detroit Unistoker—Stokers. Detroit Stoker Co., Detroit, Mich.
Dexter—Valve reseaters, air separators, steam traps. Leavitt Machine Co., Orange, Mass.
Dexter Auto Sep—Filters. Leavitt Machine Co., Orange, Mass.
Di-Acro—Benders, brakes, machines, shears. O'Neil Irwin Mfg. Co., Lake City, Minn.
Dial-A-Speed—Motors. Brown-Brockmeyer Co., Inc., Dayton, O.
Dialco—Pilot and signal lights. Dialight Corp., Brooklyn, N. Y.
Dialon—Radiator valves. Bridgeport Brass Co., Bridgeport, Conn.
Diamond—Compounds, enamels and lacquers. Thompson and Co., Oakmont, Pa.
Diamond Fibre—Gaskets. Continental Diamond Fibre Co., Newark, Del.
Diamond H—Switches, thermostats, relays. Hart Mfg. Co., Hartford, Conn.
Diaphlex—Bellows, relays, solenoids, and switches. Cook Electric Co., Chicago, Ill.
Dia Seal—Valves. Imperial Brass Mfg. Co., Chicago, Ill.
Dickbelt—Belting and drives. Dick Co., Inc., R. & J., Passaic, N. J.
Dickinson Ferrocast—Exhaust heads. Brighton-Dickinson Div., Chicago, Ill.
Dickrope—V belts and drives. Dick Co., Inc., R. & J., Passaic, N. J.
Dickvalve—Valves. Dick Co., Inc., R. & J., Passiac, N. J.
Diesel American—Oil burners. Diesel Oil Burner Corp. of New York, Jamaica, Long Island, N. Y.
Dieselite—Corrosion prevention. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Diffusaire—Diffusers. Hart & Cooley Mfg. Co., Holland, Mich.
Dilecto—Plastic pipe and tubing. Continental Diamond-Fibre Co., Newark, Del.
Dill—Testers. Trion, Inc., McKees Rocks, Pa.
Direct—Pipe fittings and flanges. Straight Line Foundry & Machine Corp., Direct Separator Div., The, Syracuse, N. Y.
Directrol—Vanes. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Discfin—Cooling surface. General Refrigeration Div., Yates-American Machine Co., Beloit, Wis.
Distributor—Radiation. Kehm Corp., The, Chicago, Ill.
Divco—Fittings, coils, pipe and tubing, sheets, plugs, solder, valves. Division Lead Co., Summit, Ill.
Dixigas—Gas welding rod. Atlantic Steel Co., Atlanta, Ga.
Dixisteel—Pipe hangers and supports, angles, flanges. Atlantic Steel Co., Atlanta, Ga.
Do-All—Combination hammer and drill. Wodack Electric Tool Corp., Chicago, Ill.
Dodge-Timken SC—Bearings. Dodge Mfg. Corp., Mishawaka, Ind.
Do-Mor—Saw tools. Pioneer Tool Co., Racine, Wis.
Dominion—Gaskets, packing. Darcoid Co., Inc., New York, N. Y.
Dorex—Adsorbers. Connor Engineering Corp., Danbury, Conn.
Doro-Chrome—Benders, cutters, tools, wrenches. Duro Metal Products Co., Chicago, Ill.
Double Check—Boiler compounds. Hampton-Cross Co., The, Louisville, Ky.
Double Diamond—Hygrometers. recorders, psychrometers. H-B Instrument Co., Philadelphia, Pa.
Double-Flow—Cooling towers. Marley Co., The, Kansas City, Mo.
Double-Seal—Copper tube fittings. Hays Mfg. Co., Erie, Pa.
Doubleton—Pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Double U—Packing. Wayne Davies & Co., Westboro, Mass.
Dowmetal—Sheets, tubing, welding rod. Dow Chemical Co., Midland, Mich.
Downblast—Unit heaters. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Dowtherm—Process heating systems. Dow Chemical Co., The, Midland, Mich.
Dowtherm—Systems. Dow Chemical Co., The, Midland, Mich.
Draft-A-Justor—Draft controls. Preferred Utilities Mfg. Corp., New York, N. Y.
Draftender—Regulators. Penn Controls, Inc., Goshen, Ind.
Draft-O-Stat—Barometric controls. Hotstream Heater Co., Cleveland, O.
Draftstop—Ventilators. American Air Filter Co., Inc., Herman Nelson Products, Louisville, Ky.
Draftrite—Gages. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Draftrite—Gages. Core-Sewell Engineering Co., St. Paul, Minn.
Dragnet—Leak detectors, testers. Universal Controls Corp., Dallas, Tex.
Drainator—Traps. Coe Mfg. Co., Painesville, O.
Drain-Dri—Sump pumps. Yeomans Bros. Co., Melrose Park, Ill.
Draintrol—Traps. Schaub Engineering Co., Fred H., Chicago, Ill.
Dricooler—Heat exchangers. Marley Co., The, Kansas City, Mo.
Dri-Pipe—Insulation. Mystik Adhesive Products, Div. of Chicago Show Printing Co., Chicago, Ill.
Drip-pump—Pumps. Peerless of America, Inc., Chicago, Ill.
Drive-IT—Hangers and supports, fasteners. Powder Power Tool Corp., Portland, Ore.
Dri-vent—Radiator air valves. Frank D. Riggio Co., Rutherford, N. J.
Dry-Ex—Water chillers. Acme Industries, Inc., Jackson, Mich.
Dryfol—Insulation. Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.
Dry-Ice—Refrigerants. Pure Carbonic, Co., Div. of Air Reduction Co., Inc., New York.
Dry-Steam—Cleaning compounds. Utility Laboratory, Inc., Brooklyn, N. Y.
Dryvin—Expansion bolts. Star Expansion Bolt Co., New York, N. Y.
Dualarc—Arc Welders. Electric Arc, Inc., Newark, N. J.
Dual-Clone—Dust collectors. Day Co., The, Minneapolis, Minn.
Dual-Dial—Gages. Rochester Mfg. Co., Inc., Rochester, N. Y.
Dual-A-Fire—Burners. Automatic Firing Corp., St. Louis, Mo.
Dualene—Fuel oil treatment. Allen Co., Robert G., Mechanicsville, N. Y.
Dualsteel—Unions. Rockwood Sprinkler Co., Worcester, Mass.
Dualvent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Duboth—Boiler water treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Duclone—Cyclone dust collectors. Ducon Co., The, Mineola, N. Y.
Duco—Enamels and lacquers, du Pont de Nemours & Co., (Inc.), E. I., Finishes Div., Wilmington, Del.
Ductatherm—Thermostats. Mercoid Corp., The, Chicago, Ill.
Ducturns—Vanes. Tuttle & Bailey, Inc., New Britain, Conn.
Ductype—Fans. South Bend Air Products, Inc., South Bend, Ind.
Dulux—Enamels and lacquers. du Pont de Nemours & Co., (Inc.), E. I., Finishes Div., Wilmington, Del.
Dum Dum—Sealing compounds. Arco Co., The, Cleveland, O.
Duo Blo—Air heaters. American Furnace Co., St. Louis, Mo.
Duoflo—Pipe line strainers. Sheffler-Gross Co., Philadelphia, Pa.
Duonetic—Gas and oil burners. Webster Engineering Co., Tulsa, Okla.
Duo-Stat—Heating systems, thermostats. Johnson Service Co., Milwaukee, Wis.
Duotrol—Regulators, switches. Automatic Control Co., St. Paul, Minn.
Duplex—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Duplex—Pipe cutting machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
Durabilt—Observation ports, conveyors. Chicago Fire Brick Co., Chicago, Ill.
DuraBilt—Registers. Auer Register Co., Cleveland, O.
Dur-Ace—Plastic pipe. American Hard Rubber Co., New York, N. Y.
Duradiant—Gas burners. Selas Corp. of America, Philadelphia, Pa.
Dura-Flex—Registers. Auer Register Co., Cleveland, O.
Duraflex—Stokers. Canton Stoker Corp., Canton, O.
Dura-Line—Registers. Auer Register Co., Cleveland, O.
Duranite—Enamels and lacquers. Atlas Powder Co., North Chicago, Ill.
DuraSpeed—Sprinkler heads. Grinnell Co., Inc., Providence, R. I.
Duratex—Adhesives and protective coatings. National Pipe Coating, Inc., Huntington Park, Calif.
Durco—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.
Durcopump—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.
Durex—Bearings. Moraine Products Div., General Motors Corp., Dayton, O.
Durichlor—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.
Duridine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Durimet—Fans, fittings, pipe, valves. Duriron Co., Inc., Dayton, O.
Duro-Blade—Regulators. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Durobrace—Pulleys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Duro-Metal-FAB—Duct connections. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Duro-Van—Vanes. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Dur-X—Plastic fittings and pipes. Franklin Plastics, Inc., Franklin, Pa.
Dustav—Filters. Air-Maze Corp., Cleveland, O.
Dust King—Dust collectors. Dust Filter Co., Chicago, Ill.
Dustkop—Dust collectors. Aget-Detroit Co., Ann Arbor, Mich.
Dust-Stop—Air Filters. Owens-Corning Fiberglas Corp., Toledo, O.
Dustube—Dust collectors. American Wheelabrator & Equipment Corp., Mishawaka, Ind.
Dutch Boy—Solder, enamels and lacquers. National Lead Co., New York, N. Y.
Duxbak—Leather belting and packing. Schieren Co., Chas. A., New York, N. Y.
Dux-Sulation—Insulation. Grant Wilson, Inc., Chicago, Ill.
Dy-Chek—Dye penetrant. Turco Products, Inc., Los Angeles, Calif.
Dynafan—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.
Dynaflow—Fans. South Bend Air Products, Inc., South Bend, Ind.
Dyna-Line—Electric motors, reducers. Brown-

Brockmeyer Co., Inc., Dayton, O.
Dynamaster—Recorders. Bristol Co., The, Waterbury, Conn.
Dynapump—Circulators, pumps. Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Dyna-Speed—Electric motors. Brown-Brockmeyer Co., Inc., Dayton, O.
Dynatrade—Electrodes. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Dynetic—Gas burners. Webster Engineering Co., Tulsa, Okla.
Dynetric—Balancing equipment. Gisholt Machine Co., Madison, Wis.

E.A.D.—Motors. Eastern Air Devices, Inc., Dover, N. H.
E-C—V belts. Goodyear Tire & Rubber Co., Akron, O.
E C & M—Motor controls, switches. Electric Controller & Mfg. Co., Cleveland, O.
EMD—Blowers. L. J. Wing Mfg. Co., Linden, N. J.
E-Z—Registers, regulators. Acme Mfg. Co., Philadelphia, Pa.
E.Z.—Hangers or brackets, Inserts. Healey Ruff Co., St. Paul, Minn.
Eastern—Tanks. Case & Son Mfg. Co., W. A., Buffalo, N. Y.
Easy-Flo—Solder. Handy & Harman, New York, N. Y.
Ebko—Conduit, exchangers, pipe. Kaiser Co., E. B., Glenview, Ill.
Eclipse—Reciprocating compressors. Frick Co., Waynesboro, Pa.
Econofeed—Pumps, systems. Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Econ-O-Flow—Furnaces. Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Econ-O-Matic—Motor bases. American Pulley Co., The, Philadelphia, Pa.
Economist—Boilers. Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Economite—Commercial and industrial gas burners. Mid-Continent Metal Products Co., Chicago, Ill.
Economizer—Nozzles. Bahnson Co., Winston-Salem, N. C.
Economy—Unit ventilators. Arex Co., Chicago, Ill.
Econostat—Heating systems. Barber-Colman Co., Rockford, Ill.
Econotherm—Boilers. Dutton Boiler Div., Hapman-Dutton Co., Kalamazoo, Mich.
Econotowers—Cooling towers. Santa Fe Tank & Tower Co. of Texas, Garland, Texas
Econovent—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.
Edco—Heaters, air conditioning units. Cauhorn Distributing Co., Detroit, Mich.
Eddy—Stokers. Eddy Stoker Corp., Chicago.
Edgeseal—Air filters. Wilson & Co., Inc., Chicago, Ill.
Edgetallic—Gaskets. Darcoid Co., Inc., New York, N. Y.
Effico—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
"88"—Pipe covering. Eagle-Picher Co., Cincinnati, O.
Elastic Metallic—Packing. Chesterton Co., A. W., Everett, Mass.
Elastic Porcelain—Tank linings. Porce-Lin Tank Lining Co., Detroit, Mich.
Elasto Rib—Vibration isolating bases. Korfund Co., Inc., Long Island City, N. Y.
Elaterite—Coatings. Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y.
Electranik—Indicator-controllers. Minneapolis-Honeywell Regulator Co., Instruments Div., Philadelphia, Pa.
Electric Filter Watchman—Gages. Herbusch Corp., The, St. Louis, Mo.
Electric Water Boy—Sump pumps. Weil Pump Co., Chicago, Ill.
Electrifugal—Centrifugal pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Electro-Airmat—Air cleaners. American Air Filter Co., Inc., Louisville, Ky.
Electro-Cell—Air cleaners. American Air Filter Co., Inc., Louisville, Ky.
Electroflo—Valves. Hays Mfg. Co., Erie, Pa.
Electrofluid—Hydraulic speed changers. Link-Belt Co., Philadelphia, Pa.
Electro-Klean—Air cleaners. American Air Filter Co., Inc., Louisville, Ky.
Electro-Mist Collector—Air cleaners. American Air Filter Co., Inc., Louisville, Ky.
Electro-Pl—Air cleaners. American Air Filter Co., Inc., Louisville, Ky.
Electro-Rod—Pipe cleaning machines. Spartan Tool Co., Chicago, Ill.
Electro-Sheet—Sheets. American Brass Co., Waterbury, Conn.
Electro-Shield—American Cladmetals Co., Carnegie, Pa.
Electro-Staynew—Air cleaners. Dollinger Corp., Rochester, N. Y.
Electroweld—Welders. Electric Arc., Inc., Newark, N. J.
Electro-Wind—Ventilators. Allen Cooler & Ventilator Inc., Rochester, Mich.
Electrunite—Stainless steel tubing and pipe, tubing benders. Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Elesco—Superheaters. Combustion Engineering, Inc., New York, N. Y.
Elgex—Steam system treatment. Elgin Softener Corp., Elgin, Ill.
Elgin—Arc welders. Borm Mfg. Co., Elgin, Ill.
Elgin—Louvers and shutters. Elgo Shutter & Mfg. Co., Detroit, Mich.
Elm—Dampers. Elgo Shutter & Mfg. Co., Detroit, Mich.
Elno—Electrolytic devices. Cleveland Heater Co., Cleveland, O.
Elsco—Blowers, compressors, pumps, valves. Electric Sprayit Div., Thomas Industries, Inc., Sheboygan, Wis.
Embee—Cement and compounds. Montgomery Bros., San Francisco, Calif.
Emco—Meters, regulators. Pittsburgh Equitable Meter Div., Rockwell Mfg. Co., Pittsburgh, Pa.
Emd-Com—Blowers. Wing Mfg. Co., L. J., Linden, N. J.
Empire—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Empire—Water meters. Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Enco—Burners, regulators, cooling units. Engineer Co., New York, N. Y.
Enduro—Sheets, tubing, pipe. Republic Steel Corp., Steel & Tubes Div., Cleveland, O.
Enduro—Unions. Jefferson Union Co., Inc., New York, N. Y.
Entrained Combustion—Gas burners. Mettler Co., Inc., The, Los Angeles, Calif.
Eonite—Fittings, pipe. Aqua-Therm, Inc., Dayton, O.
Equalizer—Deaerators, feeders, systems, traps. Acer Orgn., Inc., W. M., Meridian, Miss.
Equatemp—Balancing valves. Ohio Brass Co., Mansfield, O.
Equa-Trol—Valves. Hi-Flow Products, Inc., Lindenhurst, N. Y.
Equavalve—Pipe fittings & valves. Hi-Flow Products, Inc., Lindenhurst, N. Y.
Equiflo—Valves. Grinnell Co., Inc., Providence, R. I.
Eroduct—Insulation. Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Esco—Fittings, flanges, pipe, exchangers. Electric Steel Foundry Co., Portland, Ore.
Esco Spuncast—Pipe, tubing. Electric Steel Foundry Co., Portland, Ore.
Ermeto—Fittings. Weatherhead Co., The, Cleveland, O.
Esna—Nuts. Elastic Stop Nut Corp. of America, Union, N. J.
Esso—Oil burners, heaters. Gilbert & Barker Mfg. Co., West Springfield, Mass.
Esso Bond—Cement, refractories. Ramtite Co., The, Chicago, Ill.
Eutec-Arc—Arc welders, welding and cutting apparatus. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
EuteCrod—Welding compounds, rods, solder. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Eutec-TinWeld—Solder. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Eutector—Welding compounds. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Eutecto-Mask—Compounds. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
EutecTorch—Torches, welding and cutting apparatus. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
EutecTrode—Welding electrodes. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Evactor—Heaters and pumps. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Evanaction—Valves. Taylor Instrument Companies, Rochester, N. Y.
Everbrite—Paint. Warren Refining & Chemical Co., The, Cleveland, O.
Everdri—Sump pumps. Wade Mfg. Co., Elgin, Ill.
Everflex—Hose, coils, and tubing. Everhot Products Co., Chicago, Ill.
Everjet—Coatings, Barrett Div., Allied Chemical & Dye Corp., New York, N. Y.
Everlasting—Bolts and studs. H. M. Harper Co., Morton Grove, Ill.
Eversharp—Cutters. Everhot Products Co., Chicago, Ill.
Evertite—Clamps. Everhot Products Co., Chicago, Ill.
Evisizor—Fuel oil treatment. Evis Corp. of America, Dallas, Tex.
Evrtyte—Valves. Strong, Carlisle & Hammond Co., Cleveland, O.
Excel—Unions. Jefferson Union Co., Inc., New York, N. Y.
Excelsior—Pumps. Foster Pump Works, Inc., Brooklyn, N. Y.
Excelso—Water heaters. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Exhaustair—Fans. New York Blower Co., Chicago, Ill.
Exidust—Dust collectors. Lamson Corp., Blower Div., Syracuse, N. Y.
Expand-R-Strap—Fasteners. Gerrard & Co., A. J., Melrose Park, Ill.
Expelsor—Ejectors. Yeomans Bros. Co., Melrose Park, Ill.
Explosimeter—Leak detectors. Mine Safety Appliances Co., Pittsburgh, Pa.
Extra Dry Esotoo—Liquid sulphur dioxide. Virginia Smelting Co., West Norfolk, Va.
Eye-Hye—Indicators. Reliance Gauge Column Co., Cleveland, O.
E-Z—Cutters. Gaines-Collins, Quijada Tool Division, Los Angeles, Calif.
E-Z—Hangers and Supports, regulators. Acme Mfg. Co., Holmesburg, Philadelphia, Pa.
Ez-Arc—Arc welders. Will-Weld Mfg. Co., Inc., Omaha, Neb.
EZ Code—Electric wire. Western Lithograph Co., Los Angeles, Calif.
Ezkleen—Filters. Research Products Corp., Madison, Wis.
E-Z-On—Regulators. Gerrett Corp., M. A., Milwaukee, Wis.
E-Z See—Glasses. Remco, Inc., Zelienople, Pa.
Ezy-Kleen—Strainers. Blackmer Pump Co., Grand Rapids, Mich.

F & E—Stokers. Flynn & Emrich Co., Baltimore, Md.
FMI Particulate—Air filters. Flanders Mill, Inc., Riverhead, Long Island, N. Y.
FS—Bellows. Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Knoxville, Tenn.
F & T—Boilers. Farrar & Trefts, Buffalo, N. Y.
Fabri-Flex—Bases and pads. Vibration Mounting, Inc., Elmhurst, N. Y.
Fabrikated—Grilles, registers. Independent Register Co., Cleveland, O., New York.
Faceweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Faessler—Tube expanders, tube flaring tools. Key Co., East St. Louis, Ill.
Fan-Air—Gas burners. Mettler Co., Inc., The, Los Angeles, Calif.
Fanmix—Burners. Coppus Engineering Corp., Worcester, Mass.
Fan-Pac—Fans. DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Far-Air—Air conditioning units, filters, humidifiers. Farr Co., Los Angeles, Calif.
Farragut—Packing. Darcoid Co., Inc., New York, N. Y.
Fast's—Couplings. Koppers Company, Inc., Metal Products Div., Baltimore, Md.
FauceHot—Heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Favorite—Ratchet wrenches. Greene, Tweed & Co., North Wales, Pa.
Featherfin—Heating and cooling surface, unit coolers. Wing Mfg. Co., L. J., Linden, N. J.
Featherweight—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Feather Weight—Exchangers. Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Featherweight—Unit heaters. Wing Mfg. Co., L. J., Linden, N. J.
Federal—Floats. Reichert Float & Mfg. Co., Toledo, O.
Feedrator—Chemical feeders. Fischer & Porter Co., Hatboro, Pa.
Fel-Pro—Gaskets, packing. Felt Products Mfg. Co., Chicago, Ill.
Felt Cote—Metal Sheets. American Steel Band Co., Pittsburgh, Pa.
Fabri-Flex—Bases and pads. Vibration Mounting, Inc., Elmhurst, N. Y.
Fenn's Rotary—Ventilators. Waverly Heating Supply Co., Boston, Mass.
Ferrenewo—Valves. Lunkenheimer Co., Cincinnati, O.
Ferrodex—Compounds. MacDermid Chemical Co., Bristol, Conn.
Ferro-Therm—Insulation. American Flange & Mfg. Co., New York, N. Y.
Ferroweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Fiberglas—Insulation, tape. Owens-Corning Fiberglas Corp., Toledo, O.
Fiberlite—Insulation. Insulite Co., Minneapolis, Minn.
Fibrocel—Pipe insulation. Johns-Manville, New York, N. Y.
Fieldlink—Fittings. LaFavorite Rubber Mfg. Co., Hawthorne, N. J.
Fil-ter-All—Filters. Austin Engrg. & Mfg. Co., Inc. Ysleta (El Paso County) Tex.
Filterpure—Cooling surface, unit coolers. Betz-Corp., Hammond, Ind.
Fil-Thru—Gages. Applied Mechanics Co., Boston, Mass.
Filt-R-Ite—Himelblau Associates, Inc. Chicago, Ill.
Filt-R-Stil—Water treatment. American Cyanamid & Chemical Corp., New York, N. Y.
Filter Watchman—Air filter gages. Research Products Corp., Madison, Wis.
Findlay—Stokers. Central Rubber & Steel Corp., Findlay, O.
Fine-Screen—Strainers. Yarnall-Waring Co., Philadelphia, Pa.
Fin Fans Air Cooled—Exchangers, oil coolers. Fluor Corp., Ltd., The, Los Angeles, Calif.
Fin-Flex—Registers. Auer Register Co., Cleveland, O.

Finfold—Cooling surface. Pleasantaire Corp., Washington, D. C.
Finger Strap—Fasteners. Gerrard & Co., A. J., Melrose Park, Ill.
Finmaster—Radiation. Smith Co., Inc., H. B., The, Westfield, Mass.
Finnflex—Bases, absorbers. Finn & Co., Inc., T. R., Hawthorne, N. J.
Fin Pak—Radiation. Smith Co., Inc., H. B., The, Westfield, Mass.
Fin Vector—Radiation. Dunham Co., C. A., Chicago, Ill.
Firecrete—Refractories. Johns-Manville, New York, N. Y.
Firefoil—Insulating panel. Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Fire-Guard—Industrial stokers. Eddy Stoker Corp., Chicago, Ill.
Fire-Hearth—Refractories. Fireline Stove & Furnace Lining Co., Chicago, Ill.
Fireite—Furnace cement, refractories. Johns-Manville, New York, N. Y.
Fireset—Refractories. Walsh Refractories Corp., St. Louis, Mo.
Fireye—Alarms, flame failure controls, recorders, combustion control systems. Combustion Control Div., Electronics Corp. of America, Boston, Mass.
Firma—Ventilators. Hirschman-Pohle Co., Inc., LeRoy, N. Y.
Firomatic—Filters, gages, links, switches, valves. Morse-Smith-Morse, Inc., Watertown, Mass.
Fitrite—Tools, roof ventilators. Levow, David, New York, N. Y.
Flame Buster—Spray nozzles. Grinnell Co., Inc., Providence, R. I.
Flame-o-trol—Controls. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.
Flange-Jacks—Separators. Williams & Co., J. H., Buffalo, N. Y.
Flaremaster—Benders. Everhot Products Co., Chicago, Ill.
Flat-Belt—Pulleys and sheaves. The American Pulley Co., Philadelphia, Pa.
Flatjet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Fleet-Line—Motors. Brown-Brockmeyer Co., Inc., Dayton, O.
Fleetweld—Welding electrodes. Lincoln Electric Co., Cleveland, O.
Fleetwelder—Welders. Lincoln Electric Co., Cleveland, O.
Flex—Nipples. Techniflex Corp., Port Jervis, N. Y.
Flexarc—Arc welders. Westinghouse Electric Corp., Pittsburgh, Pa.
Flexazone—Air conditioning units. Drayer-Hanson, Inc., Los Angeles, Calif.
Flexcell—Bases and pads. Celotex Corp., The, Chicago, Ill.
Flexfast—Hose clamps. Flexible Tubing Corp., Guilford, Conn.
Flexflyte—Duct fittings. Flexible Tubing Corp., Guilford, Conn.
Flexiblac—Protective coatings. Samuel Cabot, Inc., Boston, Mass.
Flexible Line—Fittings, hose. Dole Refrigerating Co., Chicago, Ill.
Flexibond—Protective coatings. Continental Products Co., Euclid, O.
Flexi-Duct—Connections. Grant Wilson, Inc., Chicago, Ill.
Flexidur—Nozzles. Bahnson Co., Winston-Salem, N. C.
Flexiflo—Diffusers. Universal Diffuser Corp., New York, N. Y.
Flexfelt—Insulation. National Gypsum Co., Buffalo, N. Y.
Flex-I-liner—Rotary pumps. Vanton Pump & Equipment Corp., New York, N. Y.
Flexloc—Lock nuts. Standard Pressed Steel Co., Jenkintown, Pa.
Flexodisc—Expansion joints. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Flexoleed—Expansion joints. Croll-Reynolds Engineering Co., Inc., New York, N. Y.
Flexon—Bellows, pipe joints, ducts. Flexonics Corp., Maywood, Ill.
Flexpansion—Fittings and hose. Techniflex Corp., Port Jervis, N. Y.
Flexpin—Couplings. Smith & Serrell, Inc., Newark, N. J.
FlexRing—Couplings. Smith & Serrell, Inc., Newark, N. J.
Flexitite—Gate valves. Ohio Brass Co., Mansfield, O.
Flextan—Packing. Chicago Belting Co., Chicago, Ill.
Flex-Tube—Analyzers, gages, manometers, switches, pilot tubes. Dwyer Mfg. Co., F. W., Chicago, Ill.
Flo—Dehydrant and acid neutralizer, for refrigerating systems. Allin Mfg. Co., Chicago, Ill.
Floatrol—Switches, regulators. Automatic Control Co., St. Paul, Minn.
Flochek—Valves. Taco Heaters, Inc., Cranston, R. I.
Flocold—Unit coolers. Drayer-Hanson, Inc., Los Angeles, Calif.
Flo-Controls—Fittings. General Heaters & Regulators Co., East Chicago, Ind.
Floetless—Sump pumps. Imperial Brass Mfg. Co., Chicago, Ill.
Floguide—Flow meters. Fischer & Porter Co., Hatboro, Pa.
Flo-Klean—Filters, strainers. Cuno Engineering Corp., Meriden, Conn.
Flo-Master—Valves. General Heaters & Regulators Co., Chicago, Ill.
Flo-Matic—Conveyors, stokers. American Coal Burner and Wood Stoker Corp., Chicago.
Floor-Level—Radiation. Rempe Co., Chicago, Ill.
Florite—Air velocity meters, and anemometers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Flo-Scope—Meters. Selas Corp. of America, Philadelphia, Pa.
Flotrol—Humidifiers, valves. Cleveland Humidifier Co., Cleveland, O.
Flo-Tube—Conveyors. Canton Stoker Corp., Canton, O.
Flo-watch—Flow meters. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Flow-Cold—Water chillers, coolers and towers. Acme Industries, Inc., Jackson, Mich.
Flowline—Pipe fittings, flanges. Welding Fittings Corp., New Castle, Pa.
Flowmaster—Pumps. Marco Co., Inc., Saginaw, Mich.
Flowrator—Meters, systems. Fischer & Porter Co., Hatboro, Pa.
Flow-Temp—Air conditioning Units. Acme Industries, Inc., Jackson, Mich.
Flow-Therm—Chillers. Acme Industries, Inc., Jackson, Mich.
Flualyzer—Analyzers. Engelhard, Inc., Chas., Newark, N. J.
Fluid Fortress—Fittings. Flodar Corp., Cleveland, O.
Fluid Joists—Coils. Fricke, Fred J., Albuquerque, N. M.
Fluidyne—Pumps. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Fluoroflex—Tubing. Resistoflex Corp., Belleville, N. J.
Flush-Kleen—Sewage ejectors and pumps. Chicago Pump Co., Chicago, Ill.
Flux-Stik—Solder and fluxes. Lake Chemical Co., Chicago, Ill.
Foambuster—Compounds. Cannon Chemical Co., Inc., Cambridge, Mass.
Foamglas—Insulation. Pittsburgh Corning Corp., Pittsburgh, Pa.
Foamglas—Insulation. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Force-Flo—Circulators, fittings, heaters, regulators, tanks. Kehm Corp., The, Chicago.
Force-Flo—Unit heaters. Trane Co., The, LaCrosse, Wis.
Ford Burnham—Boilers. Burnham Corp., Irvington, N. Y.
Form-A-Gasket—Cement and compounds. Permatex Co., Inc., Brooklyn, N. Y.
Form-A-Jig—Compounds. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Formet—Water treatment. Perolin Co., Inc., Chicago, Ill.
Fosco—Water heaters. Shoedinger, Inc., F. O., Columbus, O.
4-Point—Control systems. Perfex Corp., Milwaukee, Wis.
"400" Series—Heaters. Fitzgibbons Boiler Co., Inc., New York, N. Y.
4-Star—Adhesive tape. Johns-Manville, New York, N. Y.
Fox—Regulators. Climax Metal Products Co., Cleveland, O.
Fracto Crete—Refractories. Ramtite Co., The, Chicago, Ill.
Francke—Flexible couplings. Waldron Corp., John, New Brunswick, N. J.
Francke Parts—Couplings. Smith & Serrell, Inc., Newark, N. J.
Free-Aire—Air conditioning units, heaters. Kehm Corp., The, Chicago, Ill.
Free exhaust—Ventilators. Burt Mfg. Co., Akron, O.
Free-Flow—Ventilators. Burt Mfg. Co., Akron, O.
Fre-Flo—Strainers. Fisher Governor, Marshalltown, Ia.
Freon—Refrigerants. E. I. du Pont de Nemours & Co., Inc., "Kinetic" Chemical Div., Wilmington, Del.
Fresh Air Maker—Propeller fans, units. Schwitzer-Cummins Co., Indianapolis, Ind.
Frevent—Valves. Bridgeport Brass Co., Bridgeport, Conn.
Frictionized—Belting. Baldwin Belting, Inc., New York, N. Y.
Frigid-Capri—Air conditioning units. Frigid, Inc., Brooklyn, N. Y.
Frigistat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Frogalloy—Electrodes. McKay Co., Pittsburgh, Pa.
Frost-Tite—Fittings. Remco, Inc., Zelienople, Pa.
Fuelguard—Commercial and industrial burners. Fuelguard Co., Dallas, Tex.
Fuelguard—Regulators. Ashcraft Co., J. P., Dallas, Tex.
Fuel Saver—Boilers. International Boiler Works Co., The, East Stroudsburg, Pa.
Fuel Saver—Regulators. Nichols Instruments Co., Baltimore, Md.
Fueltone—Fuel oil treatment. Ampion Corp., Long Island City, N. Y.
Fuel-tron—Fuel oil treatment. Radiator Specialty Co., Charlotte, N. C.
Fulflo—Filters. Commercial Filters Corp., Melrose, Mass.
Fulgrip—Pulleys and sheaves. Maurey Mfg. Corp., Chicago, Ill.
Fulljet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Fulscope—Recorders, recorder-controllers, regulators. Taylor Instrument Companies, Rochester, N. Y.
Fuseair—Air diffusers. Aladdin Heating Corp., San Leandro, Calif.
Fusionweld—Tubing. Avon Tube Div., Highbe Mfg. Co., Rochester, Mich.
Fusomatic—Links. Preferred Utilities Mfg. Corp., New York, N. Y.
Fybr-Tech—Gaskets and sheets. Technical Ply-Woods, Chicago, Ill.
Fyr-Feeder—Stokers. American Coal Burner and Wood Stoker Corp., Chicago, Ill.
Fyrite—Analyzers, combustion testing kits. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Fyrite—Recorders. Cole-Sewell Engineering Co., St. Paul, Minn.
Fyritec—Recorders. Cole-Sewell Engineering Co., St. Paul, Minn.

GB—Fans. General Blower Co., Morton Grove, Ill.
G. B. C.—Gages, fans, regulators. General Blower Co., Inc., Philadelphia, Pa.
G-B Snap* On—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
G-E—Compressors, condensers, thermostats. General Electric Co., Air Conditioning Dept., Bloomfield, N. J.
G-Fin—Cooling and heating surface. Griscom-Russell Co., The, Massillon, O.
GIL—Filters, regulators. Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
GIL Governoret—Valves. Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
GIL No-Hum—Check valves. Gas & Oil Industry Laboratories, Inc., Irvington, N. J.
G-R—Aftercoolers, oil coolers, water chillers, regulators, exchangers. Griscom-Russell Co., The, Massillon, O.
G S—Anemometers, indicators, psychrometers, torches, welding apparatus. General Scientific Equipment Co., Philadelphia, Pa.
Gaco—Couplings. Gates Engineering Co., Wilmington, Del.
Gaco-Neoprene—Coatings, fittings, pipe. Gates Engineering Co., Wilmington, Del.
Gagetron—Regulators. Instruments, Inc., Tulsa, Okla.
Galbestos—Sheet metal. Robertson Co., H. H., Pittsburgh, Pa.
Galongage—Gages. Applied Mechanics Co., Boston, Mass.
Galv-O-Zinc—Coatings. Blue Ridge Talc Co., Inc., Henry, Va.
Gascope—Leak detectors. Mine Safety Appliances Co., Pittsburgh, Pa.
Gasgun—Torches. Century Aircraft, Los Angeles, Calif.
Gas-A-Fire—Burners. Automatic Firing Corp., St. Louis, Mo.
Gas-O-Matic—Gas burners. Williams Div., Eureka Williams Corp., Div. of Henney Motor Co., Inc., Bloomington, Ill.
Gas Pak—Welding rod. Marquette Mfg. Co., Minneapolis, Minn.
Gask-o-Seal—Gaskets. Wolfe Co., Inc., The, Franklin C., Culver City, Calif.
Gast—Filters, separators. Johnson Corp., The, Three Rivers, Mich.
Gasteam—Radiators. Clow & Sons, James B., Chicago, Ill.
Gasweld—Torches, regulators, welding rod and apparatus. Liquid Carbonic Corp., The, Chicago, Ill.
Geddes—Radiation. Fowler & Wolfe Radiator Co., Norristown, Pa.
Gehl—Stokers. Eddy Stoker Corp., Chicago, Ill.
Gemaco—Compressors. General Machinery Co., Spokane, Wash.
Gemco—Bolts, clamps, hangers and supports, fasteners. Goodloe E. Moore, Inc., Danville, Ill.
Gemware—Hygrometers, psychrometers, thermometers, recorders, switches. G. M. Mfg. Co., New York, N. Y.
General—Filters. General Filters, Inc., Novi, Mich.
Genetron—Refrigerants. General Chemicals Div., Allied Chemical & Dye Corp., New York, N. Y.
Genuine Stillson—Wrenches. Walworth Co., New York, N. Y.
Geometric—Chasers. Greenfield Tap & Die Corp., Greenfield, Mass.
Giant—Radiation. John J. Nesbitt, Inc., Philadelphia, Pa.
Giant—Radiator hangers. Western Hanger Co., San Francisco, Calif.
Gilbarco—Compressors, oil burners, heaters,

Pumps. Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilsonite—Protective coatings. Ohmlac Paint & Refining Co., Inc., New York, N. Y.
Gilt Edge—Belting. Rhoads & Sons, J. E., Philadelphia, Pa.
Gland-Pakt—Expansion joints. Yarnall-Waring Co., Philadelphia, Pa.
Glazecoat—Building insulation. Johns-Manville, New York, N. Y.
Glo Tech—Glass pipe. Fischer & Porter Co., Hatboro, Pa.
Glowan—Gas burners. Martin Co., Inc., J. O., San Francisco, Calif.
Gloweld—Welded steel tubing. Globe Steel Tubes Co., Milwaukee, Wis.
Glucosates—Compounds, steam system treatment. Haering & Co., Inc., D. W., San Antonio, Tex.
Glycolator—Sterilizing units. Iron City Chemical Co., Valencia, Pa.
Glycolator—Sterilizing units. Pittsburgh Chemical Laboratories, Inc., Pittsburgh, Pa.
Glycosol—Sterilizing units. Pittsburgh Chemical Laboratories, Inc., Pittsburgh, Pa.
Glycosol—Sterilizing units. Iron City Chemical Co., Valencia, Pa.
Goetze—Gaskets. Johns-Manville, New York, N. Y.
Gohi—Sheets. Newport Rolling Mill Co., Newport, Ky.
Gold Bond—Insulation. National Gypsum Co., Buffalo, N. Y.
Good—Pumps. Goodfellow Co., Inc., E. D., Memphis, Tenn.
Goodyearite—Packing. Goodyear Tire & Rubber Co., Akron, O.
Gordon—Pipe and tubing benders. Pacific Machine & Iron Wks., Tacoma, Wash.
Grad-U-Motor—Damper operators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Gradustat—Regulators, thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Gradutrol—Diaphragm valves, radiator orifices. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Grand Rapids—Boiler vacuum cleaners. Doyle Vacuum Cleaner Co., Grand Rapids, Mich.
Granodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Granodraw—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Graycote—Cement and compounds. Chicago Gasket Co., Chicago, Ill.
Graylite—Insulation. Insulite Co., Minneapolis, Minn.
Greastop—Air filters. Air-Maze Corp., Cleveland, O.
Great Seal—Gaskets, packing, valves. New York Belting & Packing Co., Passaic, N. J.
Greenspot—Hose clamps. Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Greyhound—Welders. Duro-Dyne Corp., New Hyde Park, L. I., N. Y.
Grid—Unit coolers, radiation, unit heaters, humidifiers. Murray Mfg. Co., D. J., Wausau, Wis.
Griptube—Fittings. Flodar Corp., Cleveland.
Gripzins—Expansion bolts. Star Expansion Bolt Co., New York, N. Y.
Gritseald—Rotary pumps. St. Louis Tool Co., St. Louis, Mo.
Gruvagrip—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Gruvajoint—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Guardian—Gaskets. Garlock Packing Co., Palmyra, N. Y.
Guillotine—Cutters. Wachs Co., E. H. The, Chicago, Ill.
Gunchrome—Refractories and refractory cement. Basic Refractories, Inc., Cleveland.
Gundol—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Gun Pakt—Expansion joints. Yarnall-Waring Co., Philadelphia, Pa.
Guthfan—Fans. Guth Co., Edwin F., St. Louis, Mo.
Gyro Mass Meter—Meters. Control Engineering Corp., Controls Div., Norwood, Mass.
Gyrol Fluid Drive—Speed changer. American Blower Corp., Detroit, Mich.

H & C—Grilles, registers. Hart & Cooley Mfg. Co., Holland, Mich.
H-O-H—Compounds, feeders, steam system and water treatment. Haering & Co., Inc., D. W., San Antonio, Tex.
HS—Fans. American Blower Corp., Detroit.
Hallowell—Bearings. Standard Pressed Steel Co., Jenkintown, Pa.
Hammerkraft—Enamels and lacquers. Hilo Varnish Corp., Brooklyn, N. Y.
Hammerlin—Coatings, enamels. Interchemical Corp., Newark, N. J.
Hammermill—Belting. Goodyear Tire & Rubber Co., Akron, O.
Hammer-on—Regulators. Air Control Products, Inc., Coopersville, Mich.
Hancock—Valves. Manning, Maxwell & Moore, Inc., Stratford, Conn.
Handy—Valves. Allin Mfg. Co., Chicago, Ill.
Handy—Blenders. Holsclaw Bros., Inc., Evansville, Ind.
Handy—Ducts and duct fittings. Meyer & Bro. Co., F., Peoria, Ill.
Handy Andy—Vise stands. Western Wire Products Co., St. Louis, Mo.
Handy-Flux—Solder. Handy & Harman, New York, N. Y.
Hardweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Hartmann—Heaters. Montgomery Bros., San Francisco, Calif.
Hazleton—Pumps, strainers, valves. Barrett, Haentjens & Co., Hazleton, Pa.
Heath-Crete—Refractories. Quigley Co., Inc., New York, N. Y.
Heart-Oak—Belting. Graton & Knight Co., Worcester, Mass.
Heat-aid—Refractories. Pyrolite Products Co., Cleveland, O.
Heat-Cel—Hot gas defrosting systems. Dole Refrigerating Co., Chicago, Ill.
Heatcote—High temperature paint. Debovoise Co., The, Brooklyn, N. Y.
Heat-Crete—Concrete densifiers. Products Planning Co., Pittsburgh Pa.
Heat Extractor—Boilers. National Radiator Co., The, Johnstown, Pa.
Heat-Hog—Coolers. Heatron, Inc., York, Pa.
Heatomat—Boilers. Richmond Radiator Co., New York, N. Y.
Heat-Pak—Boilers, heaters. Aldrich Co., The, Wyoming, Ill.
Heatrim—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Heat-Rite—Registers. Auer Register Co., Cleveland, O.
Heatsaver—Systems. Advance Pump Co., Berkeley, Calif.
Heatsum—Conductors, cable. Roberson Co., L. N., Seattle, Wash.
Heat-Tite—Insulating cement. Ramtite Co., The, Chicago, Ill.
Heat-Valve—Ventilators. Swartwout Co., The, Cleveland, O.
Heat-X—Heat exchangers, aftercoolers, chillers, coolers, heaters, compressors, condensers. Heat-X Inc., Brewster, N. Y.
Heat-X-Fin—Finned surface and tubing. Heat-X Inc., Brewster, N. Y.
Heilex—Tanks. Heil Process Equipment Corp., Cleveland, O.
Heliarc—Welders. Research Vacuum Supply Co., Chicago, Ill.
Heliarc—Welders. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Heliflow—Aftercoolers, chillers, oil coolers, heat exchangers, water heaters. Graham Mfg. Co., Inc., New York, N. Y.
Hellite—Refractories. Johns-Manville, New York, N. Y.
Herco—Arc welders. Hercules Electric & Mfg. Co., Inc., Brooklyn, N. Y.
Herculoy—Tubing. Revere Copper and Brass, Inc., New York, N. Y.
Herecrol—Protective Coatings. Heresite & Chemical Co., Manitowoc, Wis.
Hev-E-Oil—Burners. Cleaver-Brooks Co., Milwaukee, Wis.
Hex-Changer—Heat Exchangers. Drayer-Hanson, Inc., Los Angeles, Calif.
Hex-Tex—Belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Hi-Cap—Furnaces. Syncromatic Corp., Watertown, Wis.
Hidden Heat—Coils and panels. Hi-Flow Products, Inc., Lindenhurst, N. Y.
Hideway—Cooling towers. Toungate & Coats, Austin, Tex.
Hi-Duty—Tubing cutters, fittings, flaring tools. Imperial Brass Mfg. Co., Chicago.
Hi-Duty—Combustion chambers. Monogram Products Co., Inc., Philadelphia, Pa.
Hi-Ef—Filters, heads, separators. Anderson Co., V. D., The, Cleveland, O.
Hi-Ex—Roof ventilators. Penn Ventilator Co., Philadelphia, Pa.
Hi-Fin—Surfaces, tubing. Doyle & Roth Mfg. Co. Inc., Brooklyn, N. Y.
Highflex—Belting. Goodrich Co., B. F., Akron, O.
High - Ten - 500—Solder. Industrial Service Laboratories, Milwaukee, Wis.
High Test—Water heaters. Burnham Corp., Irvington, N. Y.
Hi-Heat—High temperature paint. Claronex Products, Inc., Brooklyn, N. Y.
Hilger—Chillers, unit coolers, unit air conditioners, valves. XL Refrigerating Co., Inc., Chicago, Ill.
Hi-Lift—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Hi-Lo—Alarms. Yarnall-Waring Co., Philadelphia, Pa.
Hi-Lo—Pumps. Yeomans Bros. Co., Melrose Park, Ill.
Hi-Lo-Graph—Recorders. Yarnall-Waring Co., Philadelphia, Pa.
Hi-Peak—Water chillers. Acme Industries, Inc., Jackson, Mich.
Hi-Seal—Cement and compounds. Greene, Tweed & Co., North Wales, Pa.
Hi-Speed—Welding and cutting apparatus. Dockson Corp., Detroit, Mich.
Hi-Value—Tape. Johns-Manville, New York.
Hitchings—Boilers. Burnham Corp., Irvington, N. Y.
Hi - Temp—Insulation. Carey Mfg. Co., Philip, Lockland, Cincinnati, O.
Hi-Temp—Insulation cement. Zonolite Co., Chicago, Ill.
Hi-Temp—Paint. Illinois Bronze Powder Co., Chicago, Ill.
Hi-Test—Boilers. Kewanee-Ross Corp., Kewanee, Ill.
Hi-Value—Adhesive tape. Johns-Manville, New York, N. Y.
Hoffman—Draft controls. Salina Metal Products Co., Salina, Kan.
Holdtite—Solder. American Brass Co., Waterbury, Conn.
Holgun—Drills. Black & Decker Mfg. Co., Towson, Md.
Hollo-Tech—Doors and panels. Technical Ply-Woods, Chicago, Ill.
Holly—Benders. Griffith Equipment Co., Inc., Los Angeles, Calif.
Holt—Strainers, tube cleaners. Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Holtite—Bolts, screws. Continental Screw Co., New Bedford, Mass.
Holtite—Clamps. Yarnall-Waring Co., Philadelphia, Pa.
Honeycomb—Filters. Wilson & Co., Inc., Chicago, Ill.
Horton—Tanks. Chicago Bridge & Iron Co., Chicago, Ill.
Hot Boy—Unit heaters. Coroaire Heater Corp., The, Cleveland, O.
Hot Shot—Unit coolers. Drayer-Hanson, Inc., Los Angeles, Calif.
Hot Spot—Preheaters. Rempe Co., Chicago.
Hot Spot—Spot welders. Acme Electric Welder Co., Los Angeles, Calif.
Houghto-Clean—Boiler cleaning compounds. Houghton & Co., E. F., Philadelphia, Pa.
Hovalco—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.
Howlers—Alarms. Benjamin Electric Mfg. Co., Des Plaines, Ill.
Humiclean—Cleaning compounds, water treatment. Carolina Aniline & Extract Co., Charlotte, N. C.
Humidair—Humidifiers. Skilbeck Mfg. Co., Kenosha, Wis.
Humidigraph—Humidity recorders, indicator-controllers. Bristol Co., Waterbury, Conn.
Humidiguide—Hygrometers. Taylor Instrument Companies, Rochester, N. Y.
Humidomist—Nozzles, humidifiers. Supreme Electric Products Corp., Rochester, N. Y.
Humidostat—Humidistats. Johnson Service Co., Milwaukee, Wis.
Humiduct—Unit air conditioners. Bahnson Co., Winston-Salem, N. C.
Humid - U - Stat—Humidistats. Minneapolis-Honeywell Regulator Co., Minneapolis.
Humi-Temps—Unit air coolers. Larkin Coils, Atlanta, Ga.
Hum-O-Zone—Room type humidifiers. Daffin Mfg. Co., Lancaster, Pa.
Humphrey—Heaters. General Gas Light Co., Kalamazoo, Mich.
Huron—Baseboard radiation. Farrell Associates, Charles, Valencia, Pa.
Hurricane—Heaters. Zink Co., John, Tulsa, Okla.
HusHeater—Heaters. Sims Pump Valve Co., Hoboken, N. J.
Hydralt—Protective coatings. Flintkote Co., The, New York, N. Y.
Hydramotor—Valves. General Controls Co., Glendale, Calif. and Skokie, Ill.
Hydrecon—Combustion chambers. France Refractories, Co., J. H., Snow Shoe, Pa.
Hydrepair—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Hydro—Recorders. Bacharach Industrial Instrument Co., Pittsburgh, Pa.
Hydro-Flo—Heaters, heating systems, circulators, regulators. Bell & Gossett Co., Morton Grove, Ill.
Hydro-Foam—Dust collectors. Mahon Co., R. C., Detroit, Mich.
Hydro-Foil—Pumps. Peerless Pump Div., Food Machinery & Chemical Corp., Los Angeles, Calif.
Hydroline—Shaft seals. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Hydro-Matic—Connectors. Mechanical Products Corp., Chicago, Ill.
Hydron—Bellows. Clifford Mfg. Co., Div. of Standard-Thomson Corp., Waltham, Mass.
Hydro-Temp—Towers. Santa Fe Tank & Tower Co. of Texas, Garland, Tex.
Hydro-Temp—Cooling towers. Acme Equipment Co., Muskogee, Okla.
Hydro Therm—Heaters, heating systems. Hook & Ackerman, Inc., New York, N. Y.
Hydro-Whirl—Dust collectors, spray booths. Peters-Dalton, Inc., Detroit, Mich.

Hydryer—Dehumidifiers. Pritchard & Co., of California, J. F., Kansas City, Mo.
Hy-Duty—Blower wheels, fans. Schwitzer-Cummins Co., Indianapolis, Ind.
Hygrodial—Indicators and recorders. Abbeon Supply Co., Jamaica, N. Y.
Hyrate—Refractories. Plibrico Co., Chicago, Ill.
Hy-Spar—High temperature paint. Midland Paint & Varnish Co., Cleveland, O.
Hy-Speed—Pipe vises. Munton Mfg. Co., Franklin Park, Ill.
Hytemp—Insulation. Armstrong Cork Co., Lancaster, Pa.
Hy-Temp—Cement, insulation. Keasbey & Mattison Co., Ambler, Pa.
Hytempite—Cement, refractories. Quigley Co., Inc., New York, N. Y.
Hy-Test—Heaters. Burnham Corp., Irvington, N. Y.
Hy-Test—Water heaters. Smith Co., Inc., H. B., The, Westfield, Mass.
Hy-Vent—Eliminators. Taco Heaters, Inc., Cranston, R. I.
Hytork—Motors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

IMO—Pumps. De Laval Steam Turbine Co., Trenton, N. J.
I-R—Ingersoll-Rand, New York, N. Y.
IVCO—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.
Ice-Cel—Refrigeration, accumulators, chillers. Dole Refrigeration Co., Chicago, Ill.
Icy-Flo—Accumulators. McQuay, Inc., Minneapolis, Minn.
Ideal—Blowers. Perfection Grate & Stoker Co., Springfield, Mass.
Ideal—Tools. Boston Machine Works, Co., Lynn, Mass.
Ideal—Traps. Nason Co., Clarkston, Mich.
IllBronze—Paint. Illinois Bronze Powder Co., Chicago, Ill.
Imeco—Coils, surface, tubing. Industrial Mfg. & Engineering Co., Chicago, Ill.
Immersatherm—Thermostats. Mercoid Corp., The, Chicago, Ill.
Impact—Nozzles. Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
Imperial—Air conditioning units. International Metal Products Co., Phoenix, Ariz.
Impregnated—Bases and pads. Celotex Corp., The, Chicago, Ill.
Impulse—Traps. Yarnall-Waring Co., Philadelphia, Pa.
Inco—Electrodes, flanges, pipe fittings, pipe, rod, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.
Inconel—Pipe, fittings, flanges, pipe, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.
Inconel—Tubing. Trent Tube Co., East Troy, Wis.
Indeeco—Heaters, pipe heating systems. Industrial Engineering & Equipment Co., St. Louis, Mo.
Indestructible—Gaskets. New York Belting & Packing Co., Passaic, N. J.
Indoor-Outdoor—Thermostats. White-Rodgers Electric Co., St. Louis, Mo.
IngAclad—Clad sheets. Ingersoll Steel Div., Borg-Warner Corp., Chicago, Ill.
In-Hib-Co—Protective coatings. Haering & Co., Inc., D. W., San Antonio, Tex.
Inseal—Piston rings. Double Seal Ring Co., Fort Worth, Tex.
Ins-Lite—Insulation. Insulation Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.
Ins-lite—Insulation. Insulite Co., Minneapolis, Minn.
Instant—Heaters, preheaters. Johnson Corp., The, Three Rivers, Mich.
Instant Glo—Combustion chambers. Boston Machine Works Co., Lynn, Mass.
Instant-Hardner—Compounds. Eutectic Welding Alloys Corp., Flushing, N. Y., N. Y.
InstOmatic—Couplings. Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Insulag—Insulation. Quigley Co., Inc., New York, N. Y.
Insulation—Protective coatings. Minnesota Mining & Mfg. Co., St. Paul, Minn.
Insulbrix—Refractories. Quigley Co., Inc., New York, N. Y.
Insulfil—Insulation. Refractory & Insulation Corp., New York, N. Y.
Insulkote—Boiler and tank insulation. Johns-Manville, New York, N. Y.
Insulwool—Insulation. General Insulating Products Co., Brooklyn, N. Y.
Insutape—Pipe insulation, Union Asbestos & Rubber Co., Chicago, Ill.
Insutube—Insulation. Union Asbestos & Rubber Co., Chicago, Ill.
Integral Jet—Burners. Stout & Sons, David, St. Louis, Mo.
Intensarc—Electrodes. National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
Inter-Matic—Time switches. International Register Co., Chicago, Ill.
International—Liquid level gages. Applied Mechanics Co., Boston, Mass.
In-Tru—Fittings. Parker Appliance Co., The, Cleveland, O.
Involute—Spray nozzles. Yarnall-Waring Co., Philadelphia, Pa.
Ionaire—Ionization apparatus. General Ozone Corp., Chicago, Ill.
Irenew—Valves. Powell Co., Wm., The, Cincinnati, O.
Ironweld—Compounds. Sight Feed Generator Co., West Alexandria, O.
Irv-o-lite—Plastic tubing. Irvington Varnish and Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Isolant—Vibration absorbers. Finn & Co., Inc., T. R., Hawthorne, N. J.
Isomodes—Bases and pads, vibration isolating. M. B. Mfg. Co., The, New Haven, Conn.
Ivco—Roof ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.

J & C—Burners, fans, furnaces, heaters. Jackson & Church Co., Saginaw, Mich.
J E—Valves, solenoids. Jackes-Evans Mfg. Co., St. Louis, Mo.
J & H Customized—Motors. Jack & Heintz, Inc., Cleveland, O.
J-M—Gaskets, bases and pads, cement, tape. Johns-Manville, New York, N. Y.
J M Ball—Traps. Cryer Trap & Valve Div., Encor Corp., Belleville, N. J.
J O Line—Wrenches. J O Mfg. Co., South Gate, Calif.
J-W—Combustible gas alarms, leak detectors, leak testers. Johnson & Williams Ltd., Palo Alto, Calif.
Jacobus—Valves. Majot Automatic Machine Co., Inc., East Orange, N. J.
Jal Duct—Pipe. Jones & Laughlin Steel Corp., Pittsburgh, Pa.
Janitrol—Boilers, burners, heaters, furnaces, units. Surface Combustion Corp., Toledo, O.
Ject-O-Valve—Ventilators. Swartwout Co., Cleveland, O.
Jennings—Pumps, ejectors. Nash Engineering Co., South Norwalk, Conn.
Jetal—Protective coatings. Alrose Chemical Co., Providence, R. I.
Jetglas—Heaters. Payne Furnace Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
Jetglas—Heaters. Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
Jet Tube—Systems. McQuay, Inc., Minneapolis, Minn.
Jetweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Jiffy Clips—Hangers and supports. Minerallac Electric Co., Chicago, Ill.
Joaz—Stainless steel fittings. J O Mfg. Co., South Gate, Calif.
John Crane—Boiler tube expanders, seals, packing. Crane Packing Co., Chicago, Ill.
Johnsonite—Plastic pipe. Johnson Plastic Corp., Chagrin Falls, O.
Joint Seal—Cement. Utility Laboratory, Inc., Brooklyn, N. Y.
Joint Seal—Cement. Armite Laboratories, Los Angeles, Calif.
Jointite—Insulation. Mundet Cork Corp., North Bergen, N. J.
Jorgensen—Pipe clamps. Adjustable Clamp Co., Chicago, Ill.
Junior—Radiation. Weil-McLain Co., Michigan City, Ind.
JusRite—Ducts and duct fittings, pipe and fittings. Corbman Bros., Inc., Philadelphia, Pa.

K—Fittings. Kuhns Brothers Co., Dayton, O.
KAB Kool—Air conditioning units. Metal Products Engr., Inc., Los Angeles, Calif.
K. A. T.—Compounds and water treatment. American K.A.T. Corp., Garwood, N. J.
K-B—Dampers, regulators. Kerentoff, G. L., Cincinnati, O.
KD-2—Cement. Green Fire Brick Co., A. P., Mexico, Mo.
K-Fin—Cooling and heating surface. Gris-Com-Russell Co., The, Massillon, O.
K-Louver—Sun reflecting louvers. Kawneer Co., Niles, Mich.
K and M—Controls, strainers, traps, valves. Kieley & Mueller, Inc., Middletown, N. Y.
K-Master—Filters, separators, traps, valves. Kaye & MacDonald, Inc., West Orange, N. J.
KN-EVACO—Cooling towers. Kelbe-Nolds, Inc., Dallas, Tex.
K-Shield—Boiler and pipe insulation. Robinson Industries, Coleman, Mich.
Kable Kord—Belting. New York Belting & Packing Co., Passaic, N. J.
Kane—Boilers. Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Bridgeport, Pa.
Kaocast—Refractories and refractory cement. Babcock & Wilcox Co., New York, N. Y.
Kapco—Cement pipe protectors, sheets and board. Keystone Asphalt Products Co., Chicago, Ill.
Karbate—Carbon pipe, heaters, heat exchangers, pumps. National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
Kathabar—Dehumidifiers, unit air conditioners, humidifiers, air washers. Surface Combustion Corp., Toledo, O.
Kaylo—Insulation. Kaylo Div., Owens-Illinois Glass Co., Toledo, O.
Kaylo—Insulation. Owens-Corning Fiberglas Corp., Toledo, O.
Kearsarge—Insulation, gaskets. Johns-Manville, New York, N. Y.
Kek—Compounds, steam and water treatments. Kenite Laboratory, Inc., Madison, N. J.
Keldur—Bases and pads. Hobsite Products Co., Harrison, N. J.
Kelvinator—Dehumidifiers. Ebco Mfg. Co., Columbus, O.
Kemaloid—Water treatment compounds. McMillan Industrial Supplies, C. C., Portland, Ore.
Kemtex—Water softener. MacDermid Chemical Co., Bristol, Conn.
Ken—Combustion chambers. Barclay, Inc., Robert, Chicago, Ill.
Kenbric—Soot destroyers. Kenite Laboratory, Inc., Madison, N. J.
Kennison—Nozzles. Builders-Providence, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Kentucky—Sheets. Newport Rolling Mill Co., Newport, Ky.
Key Graphite—Cement and compounds. Key Co., East St. Louis, Ill.
Key Abso-Lute—Cement and compounds. Key Co., East St. Louis, Ill.
KeyKast—Pipe fittings & flanges. Key Co., East St. Louis, Ill.
Keystone—Packaged steam boiler units. Erie City Iron Wks., Erie, Pa.
Keystone—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Key-Tite—Cement and compounds. Key Co., East St. Louis, Ill.
Kidskin—Packing. Darcoid Co., Inc., New York, N. Y.
Kil-Mos—Water treatment. Chemical Engineering Co., Dallas, Tex.
Kimsul—Insulation. Kimberly-Clark Corp., Neenah, Wis.
Kinetic—Gas burners. Webster Engineering Co., Tulsa, Okla.
King-clip—Valves. Lunkenheimer Co., Cincinnati, O.
Kleen Air—Filters. Kaye & MacDonald, Inc., West Orange, N. J.
Kleenflo—Unit air filters. Air Maze Corp., Cleveland, O.
Kleen Tube—Heaters. Vapor Heating Corp., Chicago, Ill.
Kleervo—Protectors. Wright-Austin Co., Detroit, Mich.
Klero—Packing. Greene, Tweed & Co., North Wales, Pa.
Kling Felt—Tape. Products Research Co., Los Angeles, Calif.
Klingtite—Belting. Goodyear Tire & Rubber Co., Akron, O.
Klixon—Temperature control valves. Spencer Thermostat Div., Metals & Controls Corp., Attleboro, Mass.
Klondike—Arc welders. Fern, Ralph, Scranton, Pa.
Klosd Tite—Motors. Sterling Electric Motors, Inc., Los Angeles, Calif.
Knight-Ware—Pipe, prefabricated ducts, valves, ventilators. Knight, Maurice A., Akron, O.
Knock-Out—Arc welders, torches, drills. Lee Co., K. O., Aberdeen, S. D.
Kno-Draft—Air diffusers. Connor Engineering Corp., New York, N. Y.
Kold Board—Insulation. Baldwin-Hill Co., Trenton, N. J.
Kontrol Master—Air valves. Kieley & Mueller, Inc., Middletown, N. Y.
Kontrol Motor—Diaphragm valves. Kieley & Mueller, Inc., North Bergen, N. J.
Kooler-Aire—Condensers. United States Air Conditioning Corp., Minneapolis, Minn.
Kool Master—Propeller fans. Air Equipment Co., Chicago, Ill.
Kool-Shade—Solar heat resisting screens. Reflectal Corp., Subsid., Borg-Warner Corp., Chicago, Ill.
Kool-Temp—Air conditioning units. Midwest Air Conditioning Co., Des Moines, Ia.
Kopr-Kote—Cement and compounds. Jet-Lube, Inc., Burbank, Calif.
Korda—Gaskets. Chicago Gasket Co., Chicago, Ill.
Korda-Seal—Packing. Chicago Gasket Co., Chicago, Ill.
Korduct—Conduit. Johns-Manville, New York, N. Y.
Korector—Draft controls. Cole-Sewell Engineering Co., St. Paul, Minn.
Korner-King—Tools. R C S Tool Sales Corp., Joliet, Ill.
Korolac—Protective coatings. Goodrich Co., B. F., Akron, O.
Koroseal—Plastic tubing, protective coatings. Goodrich Co., B. F., Akron, O.
Kromatrol—Colorimeters. Will Corp., Rochester, N. Y.

Krome Kote—Coatings. Wolfe-Kote Co., Inc., Sheboygan, Wis.
Kromik—Coatings. Sherwin-Williams Co., The, Cleveland, O.
Kromover—Compounds. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Kuiene 131—Refrigerants. American Potash & Chemical Corp., Aerosol & Refrigeration Div., Los Angeles, Calif.
Kwikflux-Solder. Special Chemicals Corp., Ossining, N. Y.
Kwik-way—Regulators. Hart & Cooley Mfg. Co., Holland, Mich.
Kwik-Steam—Boilers. Littleford Bros., Inc., Cincinnati, O.
Kyram—Refractories and refractory cement. Quigley Co., Inc., New York, N. Y.

L. A.—Motors. The Louis Allis Co., Milwaukee, Wis.
L & H—Heaters. Thermador Electrical Mfg., Los Angeles, Calif.
L & N—Indicators. Leeds & Northrup Co., Philadelphia, Pa.
La-Co—Solder and fluxes. Lake Chemical Co., Chicago, Ill.
Lagfas—Adhesives. Foster Co., Benjamin, Philadelphia, Pa.
Lamneck—Ducts and duct fittings. Clayton & Lambert Mfg. Co., Louisville, Ky.
LaMont—High temperature heating systems. The International Boiler Works Co., East Stroudsburg, Pa.
Larco—Adhesives. Western Mineral Products Co., Minneapolis, Minn.
Lawson—Wrenches. Fairmount Tool & Forging, Cleveland, O.
L-Blow—Fans, ventilators. Trade-Wind Motor fans, Inc.; Rivera, Calif.
Leader—Stocks and dies. Oster Mfg. Co., Cleveland, O.
Leader—Unit air conditioning. Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Leader—Water heaters. Day & Night Div., Affiliated Gas Equip., Inc., Monrovia, Calif.
Leadtex—Sheets. Revere Copper & Brass, Inc., New York, N. Y.
Leaflex—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Leak Lock—Cement and compounds. Highside Chemicals Co., Clifton, N. J.
Leak-Tec—Leak testers. American Gas & Chemicals, Inc., New York, N. Y.
Lectro-Clad—Protective coatings, fittings, pipe, sheets. Bart Mfg. Inc., Belleville, N. J.
Lectrodryer—Dehumidifiers. Pittsburgh Lectrodryer Corp., Pittsburgh, Pa.
Led-Plate—Cement and compounds. Armite Laboratories, Los Angeles, Calif.
Ledaloyl—Sleeve bearings. Johnson Bronze Co., New Castle, Pa.
Leigh—Roof ventilators. Air Control Products, Inc., Coopersville, Mich.
Lekro-Tektor—Electrolytic devices. Marlo Coil Co., St. Louis, Mo.
Lektro-Kleen—Air cleaners. Lennox Furnace Co., Marshalltown, Ia., Syracuse, N. Y. & Columbus, O.
Leraydo—Zinc sheets. Illinois Zinc Co., Chicago, Ill.
Levalarm—Alarm. Reliance Gauge Column Co., Cleveland, O.
Levelizer—Gas regulators. Mueller Climatrol, Milwaukee, Wis.
Level-Master—Regulators. Sporlan Valve Co., St. Louis, Mo.
Levelometer—Gages, recorders. Liquidometer Corp., Long Island City, N. Y.
Levelrator—Indicators, alarms, gages, recorders, regulators, switches. Fischer & Porter Co., Hatboro, Pa.
Level-Temp—Thermostats. White-Rodgers Electric Co., St. Louis, Mo.
Level-Trol—Regulators. Fisher Governor Co., Marshalltown, Ia.
Lever-Seald—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.
Liberty—Packing. Johns-Manville, New York, N. Y.
Liberty—Ventilators, caps. Penn Ventilating Co., Philadelphia, Pa.
Life Line "A"—Electric motors. Westinghouse Electric Corp., Pittsburgh, Pa.
Lightening Hole—Punches. M-M-A, Inc., Lancaster, Pa.
Lightning—Cleaning compounds. Western Chemical Co., Kansas City, Mo.
Lightweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Lima—Stokers. Carnes, Inc., John R., Lima, O.
Limit-Load—Centrifugal fans. Buffalo Forge Co., Buffalo, N. Y.
Limitorque—Valves, valve operators. Philadelphia Gear Works, Inc., Philadelphia, Pa.
Limpet—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Lincoln—Air conditioning units. Forston Co., Houston, Texas
Lincwelder—Welders. Lincoln Electric Co., The, Cleveland, O.
Line—Electric motors, speed reducers. Brown-Brockmeyer Co., Inc., Dayton, O.
Lineflow—Fans. American Blower Corp., Detroit, Mich.
Line-o-flo—Air diffusers. Barber-Colman Co., Rockford, Ill.
Link-Grip—Pipe wrenches. American Machine Wks., Inc., Racine, Wis.
Lincolnweld—Arc welders. Lincoln Electric Co., The, Cleveland, O.
Linovector—Heating surface. Vulcan Radiator Co., Hartford, Conn.
Lipco—Cement lined fittings and pipe. Cement Lined Pipe Co., Lynn, Mass.
Liquid Eye—Sight glasses. Allin Mfg. Co., Chicago, Ill.
Liquid wrench—Solvent. Radiator Specialty Co., Charlotte, N. C.
Liquiflux—Welding compounds. Sight Feed Generator Co., West Alexandria, O.
Liqui-Jector—Filters. Selas Corp. of America, Philadelphia, Pa.
Lite-Cast—Combustion chambers. Monogram Products Co., Inc., Philadelphia, Pa.
Lite-Mite—Stands, wrenches. International Forge Co., Chicago, Ill.
Lithcote—Coatings. Lithgow Corp., Chicago.
Lithoform—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Little Beaver Pumps—Johnston Pump Co., Pasadena, Calif.
Little Blacksmith—Punches, shears. Kidder Mfg. Co., Inc., J. F., Burlington, Vt.
Little Giant—Sump pumps. Chicago Pump Co., Chicago, Ill.
Little Giant—Stock and dies. Greenfield Tap & Die Corp., Greenfield, Mass.
Little Giant—Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.
Little Giant—Pumps. Gelber Co., Samuel S., Chicago, Ill.
Little Giant—Pipe crimper tools. Pioneer Tool Company, Racine, Wis.
Livermont—Wrenches, tools. Richmont, Inc., Monrovia, Calif.
Lloyd—Solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Lo-Blast—Burners. Mid-Continent Metal Products Co., Chicago, Ill.
Lo-Fin—Surfaces, tubing. Doyle & Roth Mfg. Co., Inc., Brooklyn, N. Y.
Lo-Veyor—Conveyor. Ajax Flexible Coupling Co., Westfield, N. Y.
Lockaire—Insulation. Plastergon Wall Board Co., Buffalo, N. Y.
Lock-Joint—Ducts. Inland Steel Products Co., Milwaukee, Wis.
Lock-o-Seal—Gaskets. Wolfe Co., Inc., The Franklin C., Culver City, Calif.
Lockseam—Pipe. Naylor Pipe Co., Chicago.
Lockseam—Tubing. Helical Tube Corporation, East Orange, N. J.
Lo-K—Insulation. Lockport Mills, Inc., Lockport, N. Y.
Lok-Joint—Insulation. Insulite Co., Minneapolis, Minn.
Lolag—Heaters. American Instrument Co., Inc., Silver Spring, Md.
Long Life—Hose, packing. Goodall Rubber Co., Trenton, N. J.
Longlife—Coating. Flexrock Co., Philadelphia, Pa.
Longrip—Pipe extractors. Ridge Tool Co., Elyria, O.
Lookout Heggie-Simplex—Boilers, heaters. Lookout Boiler & Mfg. Co., Chattanooga.
Lord Burnham—Boilers. Burnham Corp., Boiler Div., Irvington, N. Y.
Lo-Set—Stokers. Canton Stoker Corp., Canton, O.
LoTemp—Pipe, surface. Industrial Mfg. & Engineering Co., Chicago, Ill.
Louvre—Louvers and shutters. Kelvin-White Co., Boston, Mass.
Lowcost—Boilers. Murray Iron Works Co., Burlington, Ia.
Lowdensite—Insulation. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis.
Lown—Machines. San Angelo Foundry & Machine Co., San Angelo, Tex.
Low Pressure Drop—Strainers. Zurn Mfg. Co., J. A., Industrial Div., Erie, Pa.
Low Type—Ventilators. Burt Mfg. Co., Akron, O.
Loxin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Loxit—Fittings. Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Loxite—Pipe covering adhesives. Xylos Rubber Co., Akron, O.
Luminite—Boiler cleaning compounds, steam system treatment. Warren Refining & Chemical Co., The, Cleveland, O.
Luxaire—Heaters. Olsen Mfg. Co., C. A., Elyria, O.
Lyonore Metal—Sheets. Lyon, Conklin & Co., Inc., Baltimore, Md.

M.E.—Fans. New York Blower Co., Chicago.
M. E.—Motors. Marathon Electric Mfg. Corp., Wausau, Wis.
M. & E.—Cooling surface, tubing, unit coolers, unit heaters. Merchant & Evans Co., Philadelphia, Pa.
M & F—Rubber base enamel. American-Marietta Co., Chicago, Ill.
M & H—Sheets. Matthiessen & Hegeler Zinc Co., La Salle, Ill.
MIF—Couplings, fittings. Malleable Iron Fittings Co., Branford, Conn.
MKO—Pumps. Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., Philadelphia, Pa.
M & M—Alarms, cut-offs, feeders, humidifiers, indicators, operators, pumps, regulators, switches, valves. McDonnell & Miller, Inc., Chicago, Ill.
M-Pel-Air—Blades, fans. Brookside Products Co., Inc., McCordsville, Ind.
M-R-C—Ball bearings. Marlin-Rockwell Corp., Jamestown, N. Y.
M-Scope—Pipe locators, leak detectors. Fisher Research Laboratory, Inc., Palo Alto, Calif.
M & T—Welders. Metal & Thermit Corp., New York, N. Y.
M/W and A/C Airmat—Air filters. American Air Filter Co., Inc., Louisville, Ky.
M-VB—Valves. Scovill Mfg. Co., Waterville Div., Waterville, Conn.
Macheta—Fans, fan blades, ventilators. Aerovent Fan Co., Inc., Piqua, O.
Maco—Treated cloth. Menardi & Co., El Segundo, Calif.
Magic—Cement and compounds. Blue Ridge Talc Co., Inc., Henry, Va.
Magic-Aire—Fans, air conditioning units. United Electric Service Co., Wichita Falls, Tex.
Magic Carpet—Door controls. Stanley Works, The, New Britain, Conn.
Magic Dial—Pre-assembled control systems. Midwest Automatic Control Co., Des Moines, Ia.
Magic Eye—Sight glasses. Imperial Brass Mfg. Co., Chicago, Ill.
Magic Eye Door—Door controls. Stanley Works, The, New Britain, Conn.
Magic-Grip—Sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Magic Wire—Control systems wire. Midwest Automatic Control Co., Des Moines, Ia.
Magnefer—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Magnehelic—Portable analyzers. Dwyer Mfg. Co., F. W., Chicago, Ill.
Magnetrol—Alarms, boiler cut-offs, switches. Schaub Engineering Co., Fred H., Chicago, Ill.
Magnex—Scale removal. Magnus Chemical Co., Garwood, N. J.
Magnilastic—Pipe joints and valves. Cook Electric Co., Chicago, Ill.
Mainliner—Fan blades and fans. Burden Co., Alan E., Los Angeles, Calif.
Make & Break—Valves. Dole Refrigerating Co., Chicago, Ill.
Make-up Air—Air conditioning units. New York Blower Co., Chicago, Ill.
Malgate—Valves. Powell Co., Wm., The Cincinnati, O.
Malrenew—Valves. Powell Co., Wm., The, Cincinnati, O.
Manganend—Electrodes. Arcos Corp., Philadelphia, Pa.
Manganweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Manotox—Coatings. X-Pando Corp., Long Island City, N. Y.
Manu-Rod—Pipe cleaning machines. Spartan Tool Co., Chicago, Ill.
Mar-Flex—Joints. Marquette Coppersmithing Co., Philadelphia, Pa.
Marine—Burners. Sun-Ray Burner Mfg. Corp., Jamaica, N. Y.
Mark Time—Time switches. Rhodes, Inc., M. H., Hartford, Conn.
Marocol—Compounds. O'Brien Industries, Caldwell, N. J.
Marvair—Air conditioning units. Muncie Gear Works, Muncie, Ind.
Marvel—Heaters. Bastian-Morley Co., Inc., La Porte, Ind.
Marvellaire—Air conditioning units. Meyer Furnace Co., The, Peoria, Ill.
Marvelous—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Marvelwite—Enamels and lacquers. Sonneborn Sons, Inc., L., New York, N. Y.
Masco—Combustion chambers. Munn & Steele, Inc., South Boston, Mass.
Mascote—Insulation. Munn & Steele, Inc., South Boston, Mass.
Massachusetts—Fans, unit heaters, blower wheels, air washers, housings, ventilators. Bishop & Babcock Mfg. Co., Cleveland, O.
Master—Heating systems, valves. Radiator Valve Co. of America, Philadelphia, Pa.
Master—Fittings. Mel Products Co., The, New Haven, Conn.
Master—Stokers. Muncie Gear Wks., Inc., Muncie, Ind.
Master—Unions. Jefferson Union Co., Inc., New York, N. Y.
Master—Water heaters. Kehm Corp., The, Chicago, Ill.
Master-Bilt—Pumps. Schaub Engineering Co., Fred H., Chicago, Ill.
Master Kraft—Air heaters. Harvey-Whipple, Inc., Springfield, Mass.

Master Pilot—Valves. Powell Co., Wm., The, Cincinnati, O.
Mastic—Coatings. Poe Co., C. W., The, Cleveland, O.
Maxdrill—Drills. Oster Mfg. Co., John, Milwaukee, Wis.
Maximon—Gages. J. E. Lonergan Co., Philadelphia, Pa.
Maxsteam—Boilers. Martin Co., Inc., J. O., San Francisco, Calif.
McDaniel—Floats, traps. Watson & McDaniel Co., Philadelphia, Pa.
McGregor—Glasses. Chesterton Co., A. W., Everett, Mass.
Measurrench—Wrenches. Williams & Co., J. H., Buffalo, N. Y.
Mechanipak—Seals. Garlock Packing Co., Palmyra, N. Y.
Meco—Torches, compounds, gages, regulators, valves, welding rod. Modern Engineering Co., St. Louis, Mo.
Melloblu—Gas burners. Beck Engineering Combustion Kompany, St. Louis, Mo.
Mercury—Pipe cutting machines. Obear & Son, W. F., Los Angeles, Calif.
Mercury actuated—Recorders. Palmer Thermometers Inc., Cincinnati (Norwood), O.
Merrill Process—Heating systems. Parks-Cramer Co., Fitchburg, Mass.
Metagraphic—Transmitters. Bristol Co., The, Waterbury, Conn.
Metakote—Enamels and lacquers. Tropical Paint & Oil Co., Cleveland, O.
Metal-Master—Shears. Wiss & Sons Co., J., Newark, N. J.
Metalflo—Tubes and tubing. H & H Tube & Mfg. Co., Detroit, Mich.
Metalhide—Protective coatings. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Metalite—Enamels and lacquers. Atlas Powder Co., North Chicago, Ill.
Metalprep—Compounds. Nielson Chemical Co., Detroit, Mich.
Metaphram—Valves. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Metco—Ducts and duct fittings. Sheet Metal Mfg. Co., Inc., Brooklyn, N. Y.
Meteor—Hoists. Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Metermax—Thermometers. Leeds & Northrup Co., Philadelphia, Pa.
Met-L-Flex—Bases and pads. Robinson Aviation, Inc., Vibrashock Div., Teterboro, N. J.
Metl-Tech—Doors and panels, metal sheets. Technical Ply-Woods, Chicago, Ill.
Metrotherm—Thermostats. General Controls Co., Glendale, Calif.
Micafil—Insulation. Munn and Steele, Inc., South Boston, Mass.
Mico—Insulation. Mineral Insulation Co., Chicago Ridge, Ill.
Micro—Low water cut-offs. Maid-O'-Mist, Inc., Chicago, Ill.
Microclone—Collectors. Dustex Corp., Buffalo, N. Y.
Micro-Feed—Humidifiers. Cleveland Humidifier Co., Cleveland, O.
Proportioneers, Inc., Div. of B-I-F Industries, Inc. Providence, R. I.
Micro-Klean—Filters. Cuno Engineering Corp., Meriden, Conn.
Microlite—Insulation, wrap pipe. Glass Fibers, Inc., Toledo, O.
Micromax—Recorders, indicator and recorder-controllers, thermometers. Leeds & Northrup Co., Philadelphia, Pa.
Micromet—Water treatment. Calgon Inc., Pittsburgh, Pa.
Micromotors—Motors. Redmond Co., Inc., Owosso, Mich.
Micro-Netic—Feeders. Campbell Co., J. A., Long Beach, Calif.
MicroRold—Sheets. Washington Steel Corp., Washington, Pa.
Microtherm—Thermostats. Barber-Colman Co., Rockford, Ill.
Microvac—Pumps. Stokes Machine Co., F. J., Philadelphia, Pa.
Micro-Weld—Spot welders. Micro Products Co., Chicago, Ill.
Midget—Radiation. Utica Radiator Corp., Utica, N. Y.
Midget Powerhouse—Unit heaters. Century Engineering Corp., Cedar Rapids, Ia.
Midget Waterboy—Float valves. Maid-O'-Mist, Inc., Chicago, Ill.
Mighty Midget—Drills. Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Mighty Mite—Thermostats. Mechanical Industries Production Co., Akron, O.
Milcor—Angles, ducts, doors and panels. Inland Steel Products Co., Milwaukee, Wis.
Milex—Plastic pipe fittings. Tenco, Inc., Winona, Minn.
Milford—Tools. Thompson & Son Co., The, Henry G., New Haven, Conn.
Mills—Boilers. Smith Co., Inc., H. B., The, Westfield, Mass.
Milvaco—Air eliminators, floats, strainers, traps, valves. Milwaukee Valve Co., Milwaukee, Wis.
Mindicator—Gages. Dickson Co., The, Chicago, Ill.
Minicordes—Recorders. Dickson Co., The, Chicago, Ill.
Minneapolis—Compressors. North Penn Co., New York, N. Y.
Mipco—Valves. Marine & Industrial Products Co., Philadelphia, Pa.
Miracle—Adhesives, fasteners. Devices, Inc., New York, N. Y.
Miracle Red—Coatings. Debovoise Co., The, Brooklyn, N. Y.
Mirrolac—Enamels and lacquers. Devoe & Reynolds Co., Inc., New York, N. Y.
Mixend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.
MKAYO—Boilers. Mears-Kane-Ofeldt Inc., Div. S. T. Johnson Co., Philadelphia, Pa.
Mobilene—Gaskets. Johns-Manville, New York, N. Y.
Model Star—Valves. Powell Co., Wm., The, Cincinnati, O.
Moderator—Heating System. Webster Co., Warren, Camden, N. J.
ModernAire—Fans, unit air conditioners. National Gas Equipment Co., Inc., Denison, Tex.
Modu-Aire—Air conditioning units. United States Air Conditioning Corp., Minneapolis.
Moduflow—Control systems. Minneapolis-Honeywell Regulator Co., Minneapolis.
Modulatic—Boilers. Vapor Heating Corp., Chicago, Ill.
Modustat—Valves. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Modutrol—Heating systems, valve and duct operators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Modutron—Regulators. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Mogul—Packing. Johns-Manville, New York.
Mogul—Boiler cleaning compounds, soot destroyers and water treatment. North American Mogul Products Co., The, Cleveland, O.
Moisture Magnet—Dehumidifiers. Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Moldisc—Grinders and grinding wheels. Raybestos-Manhattan, Inc., Passaic, N. J.
Moncrief—Ducts and duct fittings, heaters. Henry Furnace Co., The, Medina, O.
Monel—Pipe fittings, flanges, pipe, sheets, tubing. International Nickel Co., Inc., The, New York, N. Y.
Monend—Arc welding electrodes. Arcos Corp., Philadelphia, Pa.
Mongol—Pipe joint cement and compounds. Baer Bros., New York, N. Y.
Monmouth—Filters, humidifiers, valves. Cleveland Humidifier Co., Cleveland, O.
Mono-Block—Insulation. Baldwin-Hill Co., Trenton, N. J.
Monobolt—Chillers, oil coolers, water heaters. Graham Mfg. Co., Inc., New York, N. Y.
Mono-Cast—Pipe. American Cast Iron Pipe Co., Birmingham, Ala.
Monocast—Refractories and refractory cement. Ramtite Co., The, Chicago, Ill.
Monoflo—Hot water heating systems and fittings. Bell & Gossett Co., Morton Grove, Ill.
Monofold—Manifolds and headers. Dahl, G. W., Bristol, R. I.
Monogram—Combustion chambers. Grant Wilson, Inc., Chicago, Ill.
Mono-Line—Refractories. Quigley Co., Inc., New York, N. Y.
Monoloct—Heat exchangers. Graham Mfg. Co., Inc., New York, N. Y.
Monomotors—Motors. Redmond Co., Inc., Owosso, Mich.
Mono-Peen—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Monotube—Link-Belt Co., Chicago, Ill.
Monovent—Ventilators. Burt Mfg. Co., Akron.
Monoxivent—Fittings. Kent-Moore Organization, Inc., Detroit, Mich.
Monsoon—Fans, grilles, louvers. Jamieson Mfg. Co., Dallas, Texas.
Morflex—Flexible couplings. Morse Chain Co., Detroit, Mich.
Morgrip—V belts. Maurey Mfg. Corp., Chicago, Ill.
Mor-Heat—Treatment to inhibit corrosion, compounds. Moreheat Distribution, Inc., Cincinnati, O.
Morlex—Steam system treatment. Carbide & Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., New York.
Mortairset—Refractories. Walsh Refractories Corp., St. Louis, Mo.
Mortite—Gaskets. Mortell Co., J. W., Kankakee, Ill.
Moto-Merco—Relays. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Motopump—Pumps. Yeomans Bros. Co., Melrose Park, Ill.
MotoReducer—Speed reducers. Philadelphia Gear Works, Inc., Philadelphia, Pa.
Motorstoker—Stokers. Hershey Machine & Foundry Co., Motorstoker Div., Manheim, Pa.
Motosteel—Valves. Taylor Instrument Companies, Rochester, N. Y.
Mototrol—Indicator-controllers. Automatic Control Co., St. Paul, Minn.
Mototurb—Ventilators. Uno Ventilator Co., Malden, Mass.
Mouat—Compounds, eliminators, traps. Squires Co., C. E., The, Cleveland, O.
Mountain Air—Air conditioning units. Central States Mfg. Co., Inc., Arkansas City, Kan.
Muckle-Vent—Ventilators. Muckle Mfg. Co., Owatonna, Minn.
Muffletone—Insulation. Celotex Corp., The, Chicago, Ill.
Mullitex—Refractories. Walsh Refractories Corp., St. Louis, Mo.
Mult-Au-Matic—Threading and boring machines. Bullard Co., The, Bridgeport, Conn.
Multiblade—Welding fume exhausters. General Blower Co., Morton Grove, Ill.
Multiclone—Dust collectors. Western Precipitation Corp., Los Angeles, Calif.
Multi-Duty—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Multi-duty—Pulleys and sheaves. Gates Rubber Co., The, Denver, Colo.
Multi-Flex—Ducts and duct fittings. United States Rubber Co., New York, N. Y.
Multilarm—Alarms. Automatic Control Co., St. Paul, Minn.
Multi Mount—Speed reducers. Sterling Electric Motors, Inc., Los Angeles, Calif.
Multiplane—Vibration isolating bases. Lord Mfg. Co., Erie, Pa.
Multi-Seal—Bolts, repair plugs. Kenney Co., L. C., Chicago, Ill.
Multitherm—Air conditioning units. Clarage Fan Co., Kalamazoo, Mich.
Multi-Tip—Gas burners. Dalzen Mfg. Co., St. Clair, Mich.
Multi-V—V-belts. Goodrich Co., B. F., Akron.
Multivane—Fans, blowers. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Multi-V-Drive—Drives. Worthington Corp., Harrison, N. J.
Multi-Vent—Diffusers, air diffusion panels. Multi-Vent Div., Pyle-National Co., The, Chicago, Ill.
Multi-Wash—Dust collectors. Schneible Co., Claude B., Detroit, Mich.
Murex—Welding electrodes. Metal & Thermit Corp., New York, N. Y.

NCG—Leak detectors, solder, oxygen systems, welding positioners, torches, welding rod. National Cylinder Gas Co., Chicago, Ill.
N-M-D—Valves. Lunkenheimer Co., Cincinnati, O.
NYB—Heating surface, fans, unit heaters. New York Blower Co., Chicago, Ill.
Nalco—Solder. National Lead Co., New York.
Nalco—Water treatment, soot destroyers. National Aluminate Corp., Chicago, Ill.
National—Ground anodes. National Carbon Co., Div. of Union Carbide & Carbon Corp., New York, N. Y.
National—Boilers, heaters. National Radiator Co., The, Johnstown, Pa.
National—Cutters. Wachs Co., E. H., The, Chicago, Ill.
National—Fans, furnaces, heaters. MaGirl Foundry & Furnace Co., Bloomington, Ill.
National—Heaters. Mid-Continent Metal Products Co., Chicago, Ill.
National—Pipe, tubes, tubing. National Tube Div., United States Steel Corp., Pittsburgh.
National—Pipe cutters. Wachs Co., E. H., The, Chicago, Ill.
National Art—Convection radiation, heat exchangers. National Radiator Co., The, Johnstown, Pa.
National-Champion—Furnaces, air heaters. National Heater Co., St. Paul, Minn.
Natur Temp—Insulation. Plastergon Wall Board Co., Buffalo, N. Y.
Naturzone—Insulation. Wilson & Co., Inc., Chicago, Ill.
Navalon—Fiber packing. Johns-Manville, New York, N. Y.
N.E. Hite—Units. Barclay, Inc., Robert, Chicago, Ill.
Nelson—Stokers, pumps, air conditioning units, ventilators. Heating Assurance, Inc., Spokane, Wash.
Nelweld—Welders. Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.
Nemo—Insulating cement. Smith & Kanzler Corp., Linden, N. J.
Neobon—Corrosion shields for pipe joints. Atlas Mineral Products Co., Mertztown, Pa.
Neo Coat—Coatings. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Nerva-Kote—Protective coatings. Rubber and Plastics Compound Co., New York, N. Y.
Nerva-Plast—Protective coatings. Rubber and Plastics Compound Co., New York, N. Y.
Nesbitt—Heaters. Webster & Co., Warren, Camden, N. J.
New Cyclone—Dust collectors. Kirk & Blum Mfg. Co., Cincinnati, O.
New Multifin—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Niagara—Meters. Buffalo Meter Co., Buffalo.
Nibco—Fittings, flanges, joints, valves. Northern Indiana Brass Co., Elkhart, Ind.
Nibcoloy—Fittings, pipe, stainless steel. Northern Indiana Brass Co., Elkhart, Ind.
Nickelend—Electrodes. Arcos Corp., Philadelphia, Pa.

Nickend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nicloy—Pipe, tubes, tubing. Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Nicolet—Insulation. Sall Mountain Co., Hamilton, O.
Nicuend—Electrodes. Arcos Corp., Philadelphia, Pa.
Nifer—Clad sheets. General Plate Div., Metals & Controls Corp., Attleboro, Mass.
"9000" Arc—Torches. Mid-States Welder Mfg. Co., Chicago, Ill.
Nite Cool—Fans. Air Equipment Co., Chicago, Ill.
No Crush—Hose. Ammerman Co., C. L., Minneapolis, Minn.
No Drip—Insulation, protective coatings. J. W. Mortell Co., Kankakee, Ill.
Nocordal—Pipe coils, refrigerating condensers, and heat exchangers. Heil Process Equipment Corp., Cleveland, O.
Non-clog—Sewage ejectors and pumps. Chicago Pump Co., Chicago, Ill.
Non-clog—Pipe line strainers. Boylston Steam Specialty Co., Chicago, Ill.
Non-Clogging—Spray nozzles. Link-Belt Co., Chicago, Ill.
Non-Con-Dux—Cement, insulation. Grant Wilson, Inc., Chicago, Ill.
Non-Frost—Insulation. Keasbey & Mattison Co., Ambler, Pa.
Nonisol—Sludge prevention treatment. Alrose Chemical Co., Providence, R. I.
Non-Sweat—Insulation. Keasbey & Mattison Co., Ambler, Pa.
No-Ox-Id—Protective coatings. Dearborn Chemical Co., Chicago, Ill.
Norblo—Dust collectors, fans. Northern Blower Co., Cleveland, O.
Norcoat—Tank linings. Norwood Associated Engineers, Inc., Springfield, Mass.
Nordstrom—Valves. Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Northwestern—Water heaters. Coe Mfg. Co., Painesville, O.
Northwind—Unit air coolers. Pleasantaire Corp., Washington, D. C.
Norwesco—Cement and compounds, boiler and radiator sealing compounds. Atlas Chemical Co., Marietta, O.
No-Spat—Welding compounds. Midland Paint & Varnish Co., Cleveland, O.
No-Thread—Fittings. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
No-Vent—Pumps and systems, Stout & Sons, David, St. Louis, Mo.
Novoid—Insulation, adhesives, vibration isolating bases. National Cork Co., Englewood, N. J.
Nox-Odor—Odor adsorber. Tamms Industries, Inc., Chicago, Ill.
Nu-Air—Adsorbers. Manning Co., Charles E. Pittsburgh, Pa.
Nu-Air—Fans, window ventilator units, blades, louvers and shutters, radiation. Meier Electric & Machine Co., Inc. Indianapolis, Ind.
Nu-Alpina—Ventilators. Inland Steel Products Co., Milwaukee, Wis.
Nu-Grip—Shears and snips. Wiss and Sons Co., J. Newark, N. J.
Nullmatic—Gages, indicators, meters, recorders. Moore Products Co., The, Philadelphia, Pa.
Nu-Notch—Mushroom ventilators. Knowles Mushroom Ventilator Co., Upper Montclair, N. J.
Nu-Wood—Insulation. Wood Conversion Co., St. Paul, Minn.
Nyavco—Valves, gages. New York Air Valve Corp., Brooklyn, N. Y.
Nylined—Sleeve bearings. Thomson Industries, Inc., Manhasset, N. Y.

OB—Valves, Ohio Brass Co., Mansfield, O.
O'B-Aid—Compounds. O'Brien Industries, Caldwell, N. J.
O'B-Aige—Water treatment. O'Brien Industries, Caldwell, N. J.
O'B-Col—Compounds. O'Brien Industries, Caldwell, N. J.
O'B-Ox—Water treatment. O'Brien Industries, Caldwell, N. J.
OCH—Filters. American Air Filter Co., Louisville, Ky.
O.E.M.—Flue caps, combustion chambers, cement and compounds. Oil Equipment Mfg. Corp., New Haven, Conn.
Oakwood—Leather belting and v-belts. Baldwin Belting, Inc., New York, N. Y.
Oasis—Electric dehumidifiers. Ebco Mfg. Co., Columbus, O.
O'Both—Water treatment. O'Brien Industries, Caldwell, N. J.
O'Burnit—Soot destroyers. O'Brien Industries, Caldwell, N. J.
Octopus—Welding fume exhausters. Chelsea Fan & Blower Co., Inc., Plainfield, N. J.
Oil-A-Fire—Burners. Automatic Firing Corp., St. Louis, Mo.
Oilbuster—Boiler cleaning compounds. Cannon Chemical Co., Inc., Cambridge, Mass.
Oil-O-Matic—Oil burners, heaters. Williams Div., Eureka Williams Corp., Div. of Henney Motor Co., Inc., Bloomington, Ill.
Oiltex—Gaskets. Chicago Gasket Co., Chicago, Ill.
Oiltite—Cement. Utility Laboratory, Inc., Brooklyn, N. Y.
Oilway—Oil fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Okay Tred—Leather belting. Houghton & Co., E. F., Philadelphia, Pa.
Ol' Faithful—Humidifiers. Maid-O'-Mist, Inc., Chicago, Ill.
Omega—Joints. Marquette Coppersmithing Co., Philadelphia, Pa.
Omniguard—Temperature alarms. Edison, Inc., Thomas A., West Orange, N. J.
One Venturi—Heating systems, fittings. Taco Heaters, Inc., Cranston, R. I.
Oriflex—Valves. Dunham Co., C. A., Chicago.
Oriflo—Flanges. Builders-Providence, Inc., B-I-F Industries, Inc., Providence, R. I.
Ori-Flowrator—Flow measuring orifices. Fischer & Porter Co., Hatboro, Pa.
Ovaltube—Gas burners. Beck Engineering Combustion Kompany, St. Louis, Mo.
Oversize—Refrigerant dehydrators. Wabash Corp., Chicago, Ill.
Oxequip—Oxygen systems, pumps, valves. Oxygen Equipment & Service Co., Chicago.
Oxweld—Welding rod, welding and cutting apparatus. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Oxyarc—Welding and cutting apparatus. Arcos Corp., Philadelphia, Pa.
Oxycuttend—Electrodes. Arcos Corp., Philadelphia, Pa.
Oyltite-Stik—Cements and compounds. Lake Chemical Co., Chicago, Ill.
Ozite—Insulation. American Hair & Felt Co., Chicago, Ill.
Ozonators—Ozone apparatus. Welsbach Corp., The, Kitson Valve Div., Philadelphia, Pa.

P. B. H.—Cocks, try cocks. Paul B. Huyette Co., Inc., Philadelphia, Pa.
P-D—Fittings. Sullivan Valve & Engineering Co., Butte, Mont.
P-D—Pumps. Peters-Dalton, Inc., Detroit.
PD—Blowers, dust collectors, stacks and chimneys, fans. Prat-Daniel Corp., South Norwalk, Conn.
PD QC—Pipe machines. Bignall & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
P.E.T.—Drills and motors. Portable Electric Tools, Inc., Chicago, Ill.
P & H—Blue print machines. Peck & Harvey, Chicago, Ill.
P & H—Welding electrodes, arc welders. Harnischfeger Corp., Milwaukee, Wis.
P. I. V. Gear—Speed changers. Link-Belt Co., Philadelphia, Pa.
Pacemakers—Coolers. McQuay, Inc., Minneapolis, Minn.
Pacific—Unit Heaters. Palmer Mfg. Corp., Phoenix, Ariz.
Pacific—Furnaces. Rosebraugh Co., W. W., Salem, Ore.
Pacific Coast—Refrigerant dehydrators. Wabash Corp., Chicago, Ill.
Packex—Sewage ejectors. Yeomans Bros. Co., Melrose Park, Ill.
Paco—Turbine pumps. Pacific Pumping Co., Oakland, Calif.
Paget—Strainers. Self Cleaning Strainer Co., Chicago, Ill.
PAINTGRIP—Sheets. Armco Steel Corp., Middletown, O.
Paladin—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Palco—Packing. Greene, Tweed & Co., North Wales, Pa.
Palco board—Insulation. Pacific Lumber Co., San Francisco, Calif.
Palco Wool-Saferized—Insulation. Pacific Lumber Co., The, San Francisco, Calif.
Palmaire—Air conditioning units, furnaces, blower wheels, unit heaters, humidifiers. Palmer Mfg. Corp., Phoenix, Ariz.
Palmetto—Packing, Greene, Tweed & Co., North Wales, Pa.
Palmetto SuperSheat—Gaskets. Greene, Tweed & Co., North Wales, Pa.
Pandux—Thermometer wells. Pacific Transducer Corp., Los Angeles, Calif.
Panelair—Heaters. Payne Furnace Div., Affiliated Gas Equipment Inc., Monrovia, Calif.
Panelbloc—Heaters. Prat-Daniel Corp., South Norwalk, Conn.
Panelray—Gas fired suspended heaters. Day & Night Div., Affiliated Gas Equipment, Inc., Monrovia, Calif.
Panel-Tex—Panel and control boards. Norristown Magnesia & Asbestos Co., Norristown, Pa.
Paneltrol—Valves. Taco Heaters, Inc., Cranston, R. I.
Pan-L-Grid—Coils and panels. Pan-L-Heat Corp., Portland, Ore.
Panther—Plastic pipes. Western Plastics Corp., Tacoma, Wash.
Papoose—Machines. Capewell Mfg. Co., Hartford, Conn.
Par—Air compressors. Lynch Corp., Anderson, Ind.
Paracoil—Coils, condensers, heaters, oil coolers, preheaters, steam traps, water chillers, aftercoolers, heating units, valves, vaporizers. Davis Engineering Corp., Elizabeth, N. J.
Paraline—Motor bases. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Parasol—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Pathfinder—Belting. Goodyear Tire & Rubber Co., Akron, O.
Pedrifugal—Centrifugal pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Pee Gee—Enamels and lacquers. Devoe & Raynolds Co., Inc., New York, N. Y.
Peerless—Pipe machines. Bignail & Keeler Div., John Ramming Machine Co., St. Louis, Mo.
Peerless—Direct radiation. American Radiator & Standard Sanitary Corp., Pittsburgh.
Peerless—Industrial stokers. Eddy Stoker Corp., Chicago, Ill.
Pelro—Asbestos packing. Greene, Tweed & Co., North Wales, Pa.
Penco—Plastic fittings, pipe. North Penn Co., New York, N. Y.
Penflex-Weld—Absorbers. Pennsylvania Flexible Metallic Tubing Co., Philadelphia, Pa.
Pennco—Sectional cast iron boilers. Pennsylvania Furnace & Iron Co., Warren, Pa.
Penn Domex—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Penn-M-Co—Fittings. Penn Mfg. Corp., of Washington, Pa., Washington, Pa.
Pennpaint—Coatings. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Penn-Power—Ventilators. Penn Ventilating Co., Philadelphia, Pa.
Penn Pullman—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Penn-Turbine—Ventilators. Penn Ventilating Co., Philadelphia, Pa.
Pennsalt—Cleaning compounds. Pennsylvania Salt Mfg. Co., Philadelphia, Pa.
Perfectaire—Dampers, furnaces, heaters, humidifiers, louvers and shutters, air conditioning units. Air Conditioning Engineering Co., Cambridge, Mass.
Perfection—Plates. Beaton & Cadwell Mfg. Co., New Britain, Conn.
Perfecto—Boiler parts, cement. Green Fire Brick Co., Mexico, Mo.
Perimaheat—Radiation. Young Radiator Co., Racine, Wis.
Perma-Fan—Condensers. Drayer-Hanson, Inc., Los Angeles, Calif.
Permadine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Perm-Align—Drills. Oster Mfg. Co., John, Milwaukee, Wis.
Permanite—Plastic Pipe. Knight, Maurice A., Akron, O.
Permaseal—Gaskets. Chicago Gasket Co., Chicago, Ill.
Pero-Kote—Coatings. Perolin Co., The, Chicago, Ill.
Pero-Nite—Soot destroyers. Perolin Co., Inc., Chicago, Ill.
Peteco—Insulating cement, chambers, refractories. Peterson Co., B. A., Dowagiac, Mich.
Pexto—Brakes, punches, shears, wrenches, machines. Peck, Stow & Wilcox Co., Southington, Conn.
Phenolex Liquid Aluminum—High temperature paint. Claronex Products, Inc., Brooklyn, N. Y.
Philatrol—Changers, feeders. Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Phil-O-Feeder—Feeders. Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Pic—Malleable unions. Dart Union Co., Providence, R. I.
Pic—Steel unions. Fairbanks Co., The, New York, N. Y.
Pier—Spot welders. Peer, Inc., Benton Harbor, Mich.
Pilostat—Flame failure controls. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Pilot—Valves. Powell Co., Wm., The, Cincinnati, O.
Pioneer—Thermostats. Crown Controls Co., Inc., New Bremen, O.
Pipe Line—Strainers. Anderson Co., V. D., The, Cleveland, O.
Pipe Master—Pipe wrenches. Erie Tool Wks., Erie, Pa.
Pipeasy—Pipe Cement. Flexrock Co., Philadelphia, Pa.
Pipe Master—Pipe cutting machines. Oster Mfg. Co., Cleveland, O.
Pipemaster—Wrenches, pipe cutters and vises. Erie Tool Wks., Erie, Pa.
Pipetite-Stik—Cements and compounds. Lake Chemical Co., Chicago, Ill.
Pistonair—Motors. Joy Mfg. Co., Pittsburgh.

Pitchlign—Roller bearings. Roller Bearing Co., of America, West Trenton, N. J.
Pittairaide—Air sterilizing units. Pittsburgh Chemical Laboratories, Inc., Pittsburgh, Pa.
Pittsburgh—Unit heaters. Automatic Gas Equipment Co., Pittsburgh, Pa.
Pittsburgh-National—Meters. Rockwell Mfg. Co., Meter & Valve Div., Pittsburgh, Pa.
Planeweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Plasgon—Cement and compounds. Samuel Cabot, Inc., Boston, Mass.
Plastic Gasket—Pipe cement. Flexrock Co., Philadelphia, Pa.
Plasticord—Wiring. Chester Cable Corp., Chester, N. Y.
Plasticork—Insulation. Armstrong Cork Co., Lancaster, Pa.
Plasticote—Electric wire. Chester Cable Corp., Chester, N. Y.
Plastoid—Furnace cement. Plastic Products Co., Detroit, Mich.
Platecoils—Coils and radiation. Tranter Mfg., Inc., Lansing, Mich.
Playford—Stokers. Rosedale Foundry & Machine Co., Pittsburgh, Pa.
Plexifin—Unit heaters. Bayley Blower Co., Milwaukee, Wis.
Plexiform—Fans. Bayley Blower Co., Milwaukee, Wis.
Plicast—Refractories. Plibrico Co., Chicago, Ill.
Pliogard—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.
Pliotron—Filters. Goodyear Tire & Rubber Co., Akron, Ohio.
Plisulate—Insulating cement and insulation. Plibrico Co., Chicago.
Plumber Krak-Stik—Cement and compounds. Lake Chemical Co., Chicago, Ill.
Plumrite—Pipe. Bridgeport Brass Co., Bridgeport, Conn.
Pluralloy—Electrodes. McKay Co., Pittsburgh, Pa.
Ply-Tech—Plywood sheets and board. Technical Ply-Woods, Chicago, Ill.
Pneumastat—Aftercoolers. Schramm, Inc., West Chester, Pa.
Pneumatractor—Aftercoolers. Schramm, Inc., West Chester, Pa.
Pneum-A-trol—Feeders. Philadelphia Pump & Machinery Co., Inc., Philadelphia, Pa.
Pneumatronic—Electronic and pneumatic temperature control equipment. Johnson Service Co., Milwaukee, Wis.
Pneu-Pump—Pumps. Yeomans Bros. Co., Melrose Park, Ill.
Poeco—Insulation, coatings. Poe Co., C. W., Cleveland, O.
Polartron—Relays, regulators, switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Poly-Flo—Plastic tubing. Imperial Brass Mfg. Co., Chicago, Ill.
Polymerin—Protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.
Polymeroid—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Polyprene—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Polytherm—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Pony—Pipe clamps. Adjustable Clamp Co., Chicago, Ill.
Poronze—Filters. Wabash Corp., Chicago.
Poro-Stone—Filters. Adams Co., Inc., R. P., Buffalo, N. Y.
Porta-Heet—Heaters. Auburn Burner Co., Auburn, Ind.
Port-A-Pony—Pipe cutting machines. Thread-Ezy Mfg. Co., Corunna, Mich.
Porta Drive—Pipe cutting machines. Muncie Gear Wks., Inc., Muncie, Ind.
Porto-Power—Pipe benders and pipe pushers, pumps, punches. Blackhawk Mfg. Co., Milwaukee, Wis.
Porto Shears—Shears. Black & Decker Mfg. Co., Towson, Md.
Portovent—Hose. Flexaust Co., New York, N. Y.
Posit-Aire—Roof ventilators. Tripar Products, Inc., Royal Oak, Mich.
Positive Arc—Arc welders. Welding Apparatus Co., Chicago, Ill.
POWair Saver—Propeller fans. Pritchard & Co. of California, J. F., Kansas City.
Poweraire—Furnaces. Jackson & Church Co., Saginaw, Mich.
Powerated—Furnaces. Jackson & Church Co., Saginaw, Mich.
Power—Belting. Rhoads & Sons, J. E., Philadelphia, Pa.
Power Gems—Boilers. Edge Moor Iron Works, Inc., Edge Moor, Del.
Power-Flame—Leak detectors. Justrite Mfg. Co., Chicago, Ill.
Power-Flame—Burners, gas. Siemon Mfg. Co., Kansas City, Mo.
Power-Flo—Fans, blowers, housings. Brookside Products Co., Inc., McCordsville, Ind.
Power-Flow—Ventilators. DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Power House—Sump pumps. Weil Pump Co., Chicago, Ill.
Powermaster—Boilers. Orr & Sembower, Inc., Reading, Pa.
Poweroil—Oil burners. Jackson & Church Co., Saginaw, Mich.
Power-Poise—Electric motors. Brown-Brockmeyer Co., Inc., Dayton, O.
Power vent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Prasco & 85% magnesia—Insulation. Pabco Products Inc., San Francisco, Calif.
Pratt & Cady—Valves. R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Precipitron—Air cleaners. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Precision—Nozzles. Benjamin Air Rifle Co., St. Louis, Mo.
Precision Molded—Insulation. Pabco Products Inc., San Francisco, Calif.
Premier—Welding rod. American Steel & Wire Div., United States Steel, Cleveland, O.
Pre-Notch—Ducts and duct fittings. Gray Metal Products, Inc., Rochester, N. Y.
Pressuregraph—Gages. Electro Products Laboratories, Inc., Chicago, Ill.
Pressure-Speed—Parts for heating and air conditioning equipment. Refrigeration Devices Co., Nutley, N. J.
Pressuretrol—Regulators, switches. Minneapolis-Honeywell Regulator Co., Minneapolis.
Prestal—Pipe and tube benders. Tal Bender, Inc., Milwaukee, Wis.
Presto-O-Lite—Leak detectors, torches. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Presto-Lock—Couplings. Drinkwater, Inc., Waukegan, Ill.
Presto-Lock—Couplings. Smith Bros. Co., Oak Park, Ill.
Prest-O-Weld—Welding and cutting apparatus. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York.
Princo—Gages, manometers, psychrometers, regulators, relays, thermometers, thermostats. Precision Thermometer and Instrument Co., Philadelphia, Pa.
Propeloflo—Meters. Builders - Providence, Inc., Div. of Builders Iron Foundry, Providence, R. I.
Prop-R-Temp.—Air conditioning units. Typhoon Air Conditioning Co., Inc., Brooklyn, N. Y.
Protectoglo—Controls. Minneapolis-Honeywell Regulator Co., Instruments Div., Philadelphia, Pa.
Protectomotor—Air filters, separators. Dollinger Corp., Rochester, N. Y.
Protector—Lamps. M-M-A, Inc., Lancaster, Pa.
Protect-O-Ray—Lamps. Lustra Corp. of America, Brooklyn, N. Y.
Protectorelay—Flame failure controls, relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Protekinsul—Protective coatings. Miracle Adhesives Corp., New York, N. Y.
Pryzoak—Belting. Graton & Knight Co., Worcester, Mass.
Puffglass—Filters. Drico Industrial Corp., New York, N. Y.
Pul-Air—Ventilators. Lyon, Conklin & Co., Inc., Baltimore, Md.
Pul Air—Ventilators. Penn Ventilating Co., Philadelphia, Pa.
Pul-Air Ridge—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Pulsorb—Gages. Lonergan Co., J. E., Philadelphia, Pa.
Pulling—Circulators, pumps. Columbus Steam Pump Works Co., Columbus, O.
Pulverzone—Stokers. American Coal Burner and Wood Stoker Corp., Chicago, Ill.
Purecel—Filters. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Puridryer—Dehumidifiers. Pritchard & Co., of California, J. F., Kansas City, Mo.
Pur-O-Fiers—Filters, separators. Air Conversion Research Corp., Chicago, Ill.
Purox—Welding and cutting apparatus. Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., New York, N. Y.
Pylets—Lights, switches. Multi-Vent Div., Pyle-National Co., Chicago, Ill.
Pylets—Switches, pilot and signal lights. Pyle-National Co., The, Chicago, Ill.
Pyratherm—Controls. Mercoid Corp., The, Chicago, Ill.
Pyrex—Glass pipe, heat exchangers, gage and sight glasses, valves, coils. Corning Glass Wks., Corning, N. Y.
Pyro—Thermometers, recorders, regulators. Pyrometer Instrument Co., Inc., The, Bergenfield, N. J.
Pyrofax—Propane gas refrigerant. Carbide and Carbon Chemicals Corp., New York.
Pyroflex—Coatings, lined pipes, tanks, enamels and lacquers. Knight, Maurice A., Akron.
Pyromaster—Regulators. Bristol Co., The, Waterbury, Conn.
Pyrotrol—Flame failure controls. Bristol Co., The, Waterbury, Conn.
Pyrotron—Recorders. Bailey Meter Co., Cleveland, O.
Pyrovisor—Controls. Bristol Co., The, Waterbury, Conn.

QD—Pulleys and sheaves. Worthington Corp., Harrison, N. J.
Q-Drains, eliminators, separators, circulators and fittings for hot water heating systems, relief valves. Quality Specialty Co., Inc., Camden, N. J.
QSU—Couplings. Dahl, G. W., Bristol, R. I. Rivera, Calif.
Q-T—Insulation. Celotex Corp., The, Chicago, Ill.
Q-Chromastic—Refractories. Quigley Co., Inc., New York, N. Y.
Q-Chrome—Refractories. Quigley Co., Inc., New York, N. Y.
Q-Seal-Damit—Boiler sealing compounds. Quigley Co., Inc., New York, N. Y.
Quad—Fans. Trade-Wind Motorfans, Inc., Los Angeles, Calif.
Quantrol—Vanes. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
Quartzoid—Sprinkler heads. Grinnell Co., Inc., Providence, R. I.
Quick-as-Wink—Valves. C. B. Hunt & Son, Inc., Salem, O.
Quick-Coupler—Valves. Dole Refrigerating Co., Chicago, Ill.
Quiet Kool—Air conditioning units. Quiet-Heet Mfg. Corp., Newark, N. J.
Quik-Label—Identification markers. Brady Co., W. H., Milwaukee, Wis.
Quik-Mask—Gaskets. Brady Co., W. H., Milwaukee, Wis.
Quik-Temp—Steam traps. Schaub Engineering Co., Fred H., Chicago, Ill.
Quikupl—Couplings, Cooper Alloy Corp., Hillside, N. J.
Quikupl—Pipe fittings. Frasse & Co., Peter A., New York, N. Y.
Quintair—Heat exchangers. Pritchard & Co., of California, J. F., Kansas City, Mo.
Quintex—Heat exchangers. Pritchard & Co., of California, J. F., Kansas City, Mo.
Quintube—Heat exchangers. Pritchard & Co., of California, J. F., Kansas City, Mo.

RBC—Roller bearings. Roller Bearing Co. of America, West Trenton, N. J.
RB Pressure—Pressure blowers. Western Blower Co., Seattle, Wash.
R. D.—Valves. Grinnell Co., Inc., Providence, R. I.
R & G—Grilles, registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
RH—Air conditioning units. McQuay, Inc., Minneapolis, Minn.
R. I.—Unions. Rhode Island Fittings Co., Providence, R. I.
R-K—Combustion control systems, regulators, valves. Ruggles-Klingemann Mfg. Co., Boston, Mass.
R & M All-Weather—Motors. Robbins & Myers, Inc., Springfield, O.
R-M—Packing. Raybestos-Manhattan, Inc., Passaic, N. J.
R. M. B.—Ball bearings. Landis & Gyr, Inc., New York, N. Y.
R & M Moyno—Pumps. Robbins & Myers, Inc., Springfield, O.
R-Mir-Dek—Protective coatings. Miracle Adhesives Corp., New York, N. Y.
RP—Air filters, water softeners. Research Products Corp., Madison, Wis.
R P M—Sheet metal. Robertson Co., H. H., Pittsburgh, Pa.
RTC—Valves. Sullivan Valve & Engineering Co., Butte, Mont.
R-U-F—Fans. Reed Unit-Fans, Inc., New Orleans, La.
R-Z-U Junior—Fire tube boilers. Fitzgibbons Boiler Co., Inc., New York, N. Y.
Rad Coil—Coils. T & H Engineering Co., Little Ferry, N. J.
Radiafin—Finned tubing, finned surface. Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Radial—Unit coolers. McQuay, Inc., Minneapolis, Minn.
Radiantweld—Tubing. Avon Tube Div., Higbe Mfg. Co., Rochester, Mich.
Radiant—Direct radiation. Burnham Corp., Irvington, N. Y.
Radiantrim—Radiation. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Radiantrol—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.
Radi-Aire—Propeller fans. Reynolds Electric Co., River Grove, Ill.
Radi-Ion—Ionization apparatus. Montgomery Bros., San Francisco, Calif.
Radioflow—Valves. Smolensky Valve Co., Inc., Bedford, O.
Radi - Vector—Radiation. Vulcan Radiator Co., Hartford, Conn.

Radolite—Cement, refractories. Pyrolite Products Co., Cleveland, O.
Rador—Thermostats. Vapor Heating Corp., Chicago, Ill.
Rajah—Packing. Johns-Manville, New York, N. Y.
Ramapo—Leather belting and v-belts. Baldwin Belting, Inc., New York, N. Y.
Ramset—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Ranarex—Analyzers, indicators, recorders. Permutit Co., New York, N. Y.
Rapid—Oil coolers. Bell & Gossett Co., Morton Grove, Ill.
Rapidayton—Units. Dayton Pump & Mfg. Co., Dayton, O.
Rapiduction—Pipe cutting machines. Oster Mfg. Co., Cleveland, O.
Ratochlor—Steam and water treatments. Fischer & Porter Co., Hatboro, Pa.
Ratogate—Valves. Fischer & Porter Co., Hatboro, Pa.
Ratosight—Alarms, flow switches. Fischer & Porter Co., Hatboro, Pa.
Ratovane—Valves. Fischer & Porter Co., Hatboro, Pa.
Raychronix—Leak dectectors, testing machines. Radioactive Products, Inc., Detroit, Mich.
Raydiant—Radiation. Weil - McLain Co., Michigan City, Ind.
Rayduct—Pipe. Bethlehem Steel Co., Bethlehem, Pa.
Raymaster—Refrigerant leak detectors. George W. Gates & Co., Inc., Franklin Sq., L. I., N. Y.
Reading—Fittings, valves. R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Ready-Pack—Clamps. Dresser Mfg. Div., Dresser Industries, Inc., Bradford, Pa.
Reco—Steam convertors, heat exchangers, headers, heaters, preheaters, tanks, unit coolers. Richmond Engineering Co., Richmond, Va.
Reco—Controllers and starters, motors, propeller fans, switches. Reynolds Electric Co., River Grove, Ill.
Reco—Radi-Aire—Fans. Reynolds Electric Co., Chicago, Ill.
Recold—Refrigerating evaporative condensers, coolers, cooling & heating surface, cooling towers, air conditioning units. Refrigeration Engineering, Inc., Los Angeles, Calif.
Record-O-Stat—Recorder-controllers. Johnson Service Co., Milwaukee, Wis.
Recoy—Chillers, condensers, cooling surface, unit air conditioners and coolers. Refrigeration Economics Co., Inc., Canton, O.
Red—Compressors, controllers and starters, heaters, indicators, operators, regulators, switches, thermostats. Cooper Co., Clark, Palmyra, N. J.
Red Cap—Ventilators, Warner Ventilator Co., La Grange, Ind.
Red Devil—Furnace and pipe joint cement. Pecora Paint Co., Philadelphia, Pa.
Red Flash—Traps. Ellis Drier Co., Chicago, Ill.
Red Head—Tongs. Billings & Spencer Co., Hartford, Conn.
Red Head—Traps. Ellis Drier Co., Chicago, Ill.
Red Head—Valves. Imperial Brass Mfg. Co., Chicago, Ill.
Redi-Bends—Coils. Capitol Mfg. & Supply Co., Columbus, O.
Redi-Stokers. General Machinery Co., Spokane, Wash.
Redi-Return—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
Red Seal—Gaskets. Chicago Gasket Co., Chicago, Ill.
Redi-Vac—Pumps. American-Marsh Pumps, Inc., Battle Creek, Mich.
Redreading-Mercury—Hygrometers, psychrometers, thermometers. Palmer Thermometers, Inc., Cincinnati, O.
Red Seal—Engines. Continental Motors Corp., Muskegon, Mich.
Red Socket—Wrenches. Lowell Wrench Co., Worcester, Mass.
Red Top—Humidistats, thermostats. H-B Instrument Co., Philadelphia, Pa.
Red Top—Insulation. United States Gypsum Co., Chicago, Ill.
Red Top—Concrete inserts. Leibfried Mfg. Corp., C. H., Brooklyn, N. Y.
Redycote—Coatings. Southport, Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Reformend—Electrodes. Arcos Corp., Philadelphia, Pa.
Refrak Screen—Gas burners. Selas Corp. of America, Philadelphia, Pa.
Refrigerated Kooler-Aire—Air conditioning units. United States Air Conditioning Corp., Minneapolis, Minn.
Rego—Regulators, valves, welding and cutting apparatus. National Cylinder Gas Co., Chicago, Ill.
Reiser—Valves. Homestead Valve Mfg. Co., Coraopolis, Pa.
Relatrol—Heating systems. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Reliance—Packing. Chicago Belting Co., Chicago, Ill.
Reliance—Regulators. American Meter Co., Inc., Philadelphia, Pa.
Remotaire—Air conditioning units. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Remote—Indicators. Yarnall - Waring Co., Philadelphia, Pa.
Remox—Steam treatment. Anderson Chemical Co., Inc., Macon, Ga.
Renewo—Valves. Lunkenheimer Co., Cincinnati, O.
Renu-Glas—Air filters. American Air Filter Co., Inc., Louisville, Ky.
Research—Belting. Graton & Knight Co., Worcester, Mass.
Resiscote—Enamels and lacquers. Reilly Tar & Chemical Corp., Indianapolis, Ind.
Reliance—Leather belting. Chicago Belting Co., Chicago, Ill.
Reps—Extractors. Walton Co., Hartford, Conn.
Resistive—Insulation. Infra Insulation, Inc., New York, N. Y.
Revolute—Blueprint machines. Paragon-Revolute Corp., Rochester, N. Y.
Revolving—Heaters. Wing Mfg. Co., L. J., New York, N. Y.
Revolving—Ventilators. Burt Mfg. Co., Akron, O.
Rex—Chain drives, coal and ash conveyors, couplings, nozzles, bearings, pumps. Chain Belt Co., Milwaukee, Wis.
Rex—Heaters. Cleveland Heaters Co., Cleveland, O.
Rex—Fans, ventilators, wheels. Air Controls, Inc., Div. of Cleveland Heater Co., Cleveland, O.
Rexarc—Electrodes, positioners and welders. Sight Feed Generator Co., West Alexandria, O.
Rex-Flex—Hose, and tubing. Flexonics Corp., Maywood, Ill.
Rexoil—Burners, heaters. Reif-Rexoil, Inc., Buffalo, N. Y.
Rexrust—Protective coatings. Continental Products Co., Euclid, O.
Rex-Tube—Duct connections, duct fittings, hose, and tubing. Flexonics Corp., Maywood, Ill.
Rex-Weld—Hose and tubing. Flexonics Corp., Maywood, Ill.
Rezistal—Sheets. Crucible Steel Co. of America, Pittsburgh, Pa.
Rhinamel—Enamels and lacquers. Tropical Paint & Oil Co., Cleveland, O.
Ridgevent—Roof ventilators. Octagon Ventilator Co., Chicago, Ill.
Ridgid—Pipe machines, wrenches, cutters, chasers, reamers, vises. Ridge Tool Co., Elyria, O.
Ridgoil—Oil. Ridge Tool Co., Elyria, O.
Rifco—Unions. Rhode Island Fittings Co., Hillsgrove, R. I.
Riflex—Vibration absorbers. United Metal Hose Co., Inc., Long Island City, N. Y.
Rigidon—Pipe. Heil Process Equipment Corp., Cleveland, O.
Rigid-Tex—Metals and sheets. Rigidized Metals Corp., Buffalo, N. Y.
Rihco—Humidifiers. Rhode Island Humidifier & Ventilating Co., Boston, Mass.
Rincontrol—Enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Rip-pl—Enamels and lacquers. Hilo Varnish Corp., Brooklyn, N. Y.
Ripple-Fin—Cooling and heating surface. McQuay, Inc., Minneapolis, Minn.
Risselt—Air valves, air eliminators. Moreheat Distribution, Inc., Cincinnati, O.
Rite-seat—Steam trap float. Reichert Float & Mfg. Co., Toledo, O.
Robot—Switches, thermostats. Miller-Harris Instrument Co., Milwaukee, Wis.
Robot-Eye—Regulators, smoke alarms. Standard Instrument Corp., New York, N. Y.
Rock—Pipe protectors. Keystone Asphalt Products Co., Chicago, Ill.
Rock cork—Pipe insulation. Johns-Manville, New York, N. Y.
Rocop—Heaters. Rome-Turney Radiator Co., Rome, N. Y.
Rodpak—Packing. Sims Pump Valve Co., Hoboken, N. J.
Rodpax—Packing. National Engineering Products, Inc., Washington, D. C.
Ro-Fin—Tubing. Rome-Turney Radiator Co., Rome, N. Y.
Ro-Flo—Compressors, pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Rolagrip—Couplings. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Rol-Air—Tools. Imperial Brass Mfg. Co., Chicago, Ill.
Roll-a-Bend—Pipe benders. Radiant Devices, St. Louis, Mo.
Roll-Bond—Heat exchangers. Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill.
Rollway—Pumps. Pioneer Pump Div., Detroit Harvester Co., Detroit, Mich.
Roofvane—Ventilators. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Roomaire—Air conditioning units. Young Radiator Co., Racine, Wis.
Roomaster—Units. Ajax Corp. of America, Evansville, Ind.
Ross—Pipe joints. Webster & Co., Warren, Camden, N. J.
Rosslyn Metal—Sheets. American Cladmetals Co., Carnegie, Pa.
Rotameter—Flow meters. Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Rotary Valvent—Ventilators. Swartwout Co., The, Cleveland, O.
Roto Blast—Furnaces. Moncrief Furnace Co., Atlanta, Ga.
Roto-Clone—Dust collectors. American Air Filter Co., Inc., Louisville, Ky.
Roto-Cup—Gas and oil burners. Best Combustion Equipment Co., Inc., W. N., Carlstadt, N. J.
Rotojet—Spray nozzles. Binks Mfg. Co., Chicago, Ill.
Roto-louvre—Dryers. Link-Belt Co., Chicago.
Rotomet—Solder and fluxes. Rotometals, San Francisco, Calif.
Rotometric—Solder and fluxes. Rotometals, San Francisco, Calif.
Rotonetic—Gas burners. Webster Engineering Co., Tulsa, Okla.
Roto-Torq—Tools. Richmont, Inc., Monrovia, Calif.
Roto-trol—Liquid pressure regulators, indicators, and switches. Healy Ruff Co., St. Paul, Minn.
Rotre—Vacuum pumps. Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Ro-Twin—Air compressors, pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Royal—Packing. United States Rubber Co., New York, N. Y.
Roxaprene—Protective coatings, enamels and lacquers. Interchemical Corp., Finishes Div., Newark, N. J.
Roxite—Pipe. United States Stoneware Co., New York, N. Y.
Roxyn C—Enamels and lacquers, protective coatings. Interchemical Corp., Finishes Div., Newark, N. J.
Royal—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Royal Clipper—Cutters and shears. M-M-A, Inc., Lancaster, Pa.
Royal, The—Ventilators. Penn Ventilator Co., Philadelphia, Pa.
Rubalt—Enamels and lacquers, protective coating. Hague & Co., Inc., Alfred, Brooklyn, N. Y.
Rubatex—Insulation. Virginia Rubatex Div., Great American Industries, Inc., Bedford, Va.
Rubyfluid—Solder. Ruby Chemical Co., Columbus, O.
Rusco Prime—Window panels. Russell Co., F. C., The, Cleveland, O.
Rusco Thermoseal—Windows. Russell Co., F. C., The, Cleveland, O.
Rust Bloc No. 20—Coatings. Turco Products, Inc., Los Angeles, Calif.
Rustbuster—Cleaning compounds. Cannon Chemical Co., Inc., Cambridge, Mass.
Rustgon—Compounds. Turco Products, Inc., Los Angeles, Calif.
Rust Evade—Coatings. Turco Products, Inc., Los Angeles, Calif.
Rust Raider—Compounds. Radiator Specialty Co., Charlotte, N. C.
Rust Veto—Protective Coatings. E. F. Houghton & Co., Philadelphia, Pa.

S-A—Conveyors, feeders. Stephens-Adamson Mfg. Co., Aurora, Ill.
SA—Valves. Lunkenheimer Co., Cincinnati, O.
S. C.—Air heaters, gas burners, recorders. Surface Combustion Corp., Toledo, O.
S.F.E.—Insulation. Standard Fuel Engineering Co., Detroit, Mich.
S I—Analyzers, indicators, recorders and systems. Standard Instrument Corp., New York, N. Y.
S-N—Air conditioning units, burners, fans, heaters, pumps, stokers. Scott-Newcomb, Inc., St. Louis, Mo.
S O H—Boilers. Titusville Iron Wks., Co., The, Titusville, Pa.
S & P—Burners, governors, preheaters, regulators, strainers, fuel oil units, valves. Staples & Pfeiffer, San Francisco, Calif.
S. R. P.—Protective coatings. Sonneborn Sons, Inc., L., New York, N. Y.
SS Unit—Pumps. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
SSS—Belting. Goodall Rubber Co., Trenton, N. J.
Sanbanol—Fuel oil treatment. American Sand-Banum Co., Inc., New York, N. Y.
Saco—Speed reducers. Stephens - Adamson Mfg. Co., Aurora, Ill.
Saf - Dry—Refrigerants. Liquid Carbonic Corp., The, Chicago, Ill.
Safe-Flo—Heaters. Screw Machine Products Co., Portland, Ore.
Safe-T-Aire—Air sterilizing units. Hanovia Chemical & Mfg. Co., Newark, N. J.

Safe Guard—Fuel oil preheaters. Alstrom Corp., New York, N. Y.
Safety—Heaters. Wing Mfg. Co., L. J., New York, N. Y.
Safety-Circle—Motors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Sahara—Dehydrators. Imperial Brass Mfg. Co., Chicago, Ill.
Sahara—Dehumidifiers. Niagara Industrial Corp., New York, N. Y.
Saint Louis—Stokers. Ormsby-Osterman, Inc., St. Louis, Mo.
Sairset—Cement. Green Fire Brick Co., Mexico, Mo.
Sal-Mo—Cement, insulation, packing, connections, sheets and board. Sall Mountain Co., Hamilton, O.
Sanidaire—Humidifiers. United States Air Conditioning Corp., Minneapolis, Minn.
Sanimaster—Heaters. Ruud Mfg. Co., Pittsburgh, Pa.
Sanitizer—Treatment. Oakite Products, Inc., New York, N. Y.
Santobrite—Water treatment. Monsanto Chemical Co., St. Louis, Mo.
Santocel—Insulation. Monsanto Chemical Co., Merimac Div., Boston, Mass.
Santosite—Water treatment. Monsanto Chemical Co., St. Louis, Mo.
Santrol—Registers. Tuttle & Bailey, Inc., New Britain, Conn.
Sarancote—Protective coatings. Saran Lined Pipe Co., Ferndale, Mich.
Satincote—Insulation, building. Insulite Div., Minnesota and Ontario Paper Co., Minneapolis, Minn.
Saunders—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.
Saunders—Pipe cutters. Erie Tool Works, Erie, Pa.
Saunders—Diaphragm valves. Grinnell Co., Inc., Providence, R. I.
Saver—Fans. Pritchard & Co. of California, J. F., Kansas City 5, Mo.
Scaico—Thermostats. Smith Control & Instrument Corp., Palmyra, N. J.
Scentinel—Compounds. Ampion Corp., Long Island City, N. Y.
Schmidt—Torches. Minn-Kota Foundry & Mfg. Co., Fargo, N. D.
Schwan—Propeller pumps. Haertel Co., Walter, Minneapolis, Minn.
Schwan—Gas burners. Jamieson Mfg. Co., Dallas, Texas.
Scoggins—Shears and snips. Pacific Machine & Iron Wks., Tacoma, Wash.
Scotch—Adhesive tape and pipe wrap. Minnesota Mining & Mfg. Co., St. Paul, Minn.
Scotch-Mund—Boilers. Mund Boilers, Inc., Los Angeles, Calif.
Scottie Jr.—Boilers. Kewanee-Ross Corp., Kewanee, Ill.
Scout—Water heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Screw-Seal—Pipe. Robinson Clay Product Co., Inc., The, Akron, O.
Scroll-Aire—Air heaters. Newcomb-Detroit Co., Detroit, Mich.
Scruin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Scru-peller—Sewage ejectors and pumps. Chicago Pump Co., Chicago, Ill.
Scru-Tite—Expansion Bolts. Mastercraft Plastics Co., Inc., Jamaica, N. Y.
Sea Lion—Leather belting. Chicago Belting Co., Chicago, Ill.
Sea Rings—Asbestos packing. Johns-Manville, New York, N. Y.
Sealastic—Fittings. Chicago Forging and Mfg. Co., Chicago, Ill.
Seal-Clad—Motors. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Sealdflow—Fans. Pritchard & Co. of California, J. F., Kansas City, Mo.
Sealeak—Compounds. Ampion Corp., Long Island City, N. Y.
Sealed Life—V-Belts. Dodge Mfg. Corp., Mishawaka, Ind.
Sealfas—Adhesives. Foster Co., Benjamin, Philadelphia, Pa.
Seal Master—Bearings. Stephens-Adamson Mfg. Co., Aurora, Ill.
Sealmore—Cement and compounds. Armite Laboratories, Los Angeles, Calif.
Seal-Rite—Cement and compounds. Macksons Co., New York., N. Y.
Seasonmaker—Air conditioning units. McQuay, Inc., Minneapolis, Minn.
Seasonmaster—Units. McQuay, Inc., Minneapolis, Minn.
Seigelite—Gaskets. Johns-Manville, New York.
Seismo-Dampers—Bases. Korfund Co., Inc., Long Island City, N. Y.
Selectair—Air conditioning units. Johnson Co., S. T., Bridgeport, Pa.
Selectric—Electric heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Selectrol—Regulators. Automatic Control Co., St. Paul, Minn.
Sells—Bearings. Royersford Foundry & Machine Co., Royersford, Pa.
Sensatherm—Thermostats. Mercoid Corp., Chicago, Ill.
Sensitrol—Relays. Weston Electrical Instrument Corp., Newark, N. J.
Sentinel—Alarms. Johnson-Williams Ltd., Palo Alto, Calif.
Sentry—Valves. McRae Corp., Glendale, Calif.
Sentry—Alarms, and smoke recorders. Edwards, L. V., Rockville Center, N. Y.
Sentry—Draft controls, draft regulators. Krueger Sentry Gauge Co., Green Bay, Wis.
Sep-return—Separators. Wabash Corp., Chicago, Ill.
Sequestrene—Water softeners. Alrose Chemical Co., Providence, R. I.
Serval—Gaskets. Chicago Gasket Co., Chicago, Ill.
Service—Packing. Johns-Manville, New York.
Servicecoat—Enamels and lacquers. Debevoise Co., The, Brooklyn, N. Y.
Sesure—Gages. Yarnall-Waring Co., Philadelphia, Pa.
Sette—Filter. Marquart Mfg. Co., Oakland, Calif.
"77"—Pipe coverings. Eagle-Picher Co., Cincinnati, O.
Severn—Boilers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Shafconaire—Unit heaters. OverHead Heaters, Inc., Detroit, Mich.
Shafer—Bearings. Chain Belt Co., Milwaukee, Wis.
Shawco—Bends, headers. Shaw Co., Benjamin F., Wilmington, Del.
Shear-Flex—Bases and pads. Vibration Mounting, Inc., Elmhurst, N. Y.
Shelby—Tubing. National Tube Div., United States Steel Corp., Pittsburgh, Pa.
Shield—Pipe protectors. Keystone Asphalt Products Co., Chicago, Ill.
Shield-Arc—Electrodes, arc welders. Lincoln Electric Co., Cleveland, O.
Shockmounts—Bases and pads. Lord Mfg. Co., Erie, Pa.
Shokstop—Absorbers. Wade Mfg. Co., Elgin, Ill.
Shone—Sewage ejectors. Yeomans Bros. Co., Melrose Park, Ill.
Shop King—Welders. Precision Welder Mfg. Co., Chicago, Ill.
Shopmate—Drills. Portable Electric Tools, Inc., Chicago, Ill.
Shuntflo—Meters. Builders-Providence, Inc., Div. of B-I-F Industries Inc., Providence, R. I.
Shur-Flo—Switches. Hays Mfg. Co., Erie, Pa.
Shur-Grip—Tools. Duro-Dyne Corp., New Hyde Park, Long Island, N. Y.
Shur-Seal—Cement. Chicago Specialty Mfg. Co., Chicago, Ill.
Shutlbrak—Switches. Adam Electric Co., Frank, St. Louis, Mo.
Shut-O-Vent—Louvers and shutters. Reed Unit-Fans, Inc., New Orleans, La.
Signico—Pilot and signal lights. Signal Injector Co., Brooklyn, N. Y.
Silastic—Packing. Dow Corning Corp., Midland, Mich.
Silastic—Industrial adhesive tape. Irvington Varnish & Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.
Silbraz—Fittings. Walworth Co., New York, N. Y.
Silence Service—Noise elimination. Industrial Sound Control, Inc., Hartford, Conn.
Silent-Auburn—Burners, heaters, air conditioning units. Auburn Burner Co., Auburn, Ind.
Silentblu—Gas burners. Beck Engineering Combustion Kompany, St. Louis, Mo.
Silent-Breeze—Fans, louvers and shutters, units. Meier Electric & Machine Co., Inc., Indianapolis, Ind.
Silent Duct—Connections. Elgen Mfg. Corp., Long Island City, N. Y.
Silent Korth—Burners. Eckhart Mfg. Co., Inc., Union, N. J.
Silentvane—Fans. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Sil-Fos—Solder. Handy & Harman, New York, N. Y.
Silicon-Alkyd—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.
Silicone—Protective coatings. Dow Corning Corp., Midland, Mich.
Silimite—Water treatment. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Sillimanite—Refractories and refractory cement. Taylor Sons Co., Charles, Cincinnati.
Sill-Line—Radiation. Nesbitt, Inc., John J., Philadelphia, Pa.
Siltube—Solder. All-State Welding Alloys Co., Inc., White Plains, N. Y.
Silver Comet—Coatings. Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Silverlume—Paint. Wilbur & Williams Co., Brighton, Mass.
Silver Steel—Cutters. Atkins Saw Div., Borg-Warner Corp., Indianapolis, Ind.
Silver Stream—Spray nozzles. Skinner Irrigation Co., Troy, O.
Silvertop—Eliminators, traps. Anderson Co., V. D., The, Cleveland, O.
Simplex—Gages. Viking Pump Co., Cedar Falls, Ia.
Simplex—Regulators. Bell & Gossett Co., Morton Grove, Ill.
Simplex—Wrenches. Lowell Wrench Co., Worcester, Mass.
Simsestos—Packing. Sims Pump Valve Co., Hoboken, N. J.
Simsite—Packing. Sims Pump Valve Co., Hoboken, N. J.
Sim-Trol—Controls. Simplex Mfg. Co., Fond du Lac, Wis.
Single-Flow—Cooling towers. Marley Co., The, Kansas City, Mo.
Sioux—Electric drills. Albertson & Co., Inc., Sioux City, Ia.
Sioux—Drills, grinders and shafts. Anderson & Co., Inc., Sioux City, Iowa.
Sirocco—Blowers, fans. American Blower Corp., Detroit, Mich.
Skelly—Stokers. Combustion Engineering-Inc., New York, N. Y.
Skip-Tooth—Dies. Nye Tool Co., Chicago, Ill.
Sky-Blast—Roof fan ventilators. Propellair Div., Robbins & Myers Inc., Springfield, O.
Skymaster—Ventilators. Acme Equipment Co., Muskogee, Okla.
Slender—Direct radiation. Dunkirk Radiator Corp., Dunkirk, N. Y.
Slenderizer—Direct radiation. Burnham Corp., Irvington, N. Y.
Slo-Speed—Reducers. Sterling Electric Motors, Inc., Los Angeles, Calif.
Sludgit—Fuel oil treatment. Anderson Chemical Co., Inc., Macon, Ga.
Sludgout—Fuel oil treatment. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Slugin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Smith-Clamp—Pipe repair clamps. Pipeline Development Co., Cleveland, O.
Smith-Dolan—Electric preheaters and stress relievers. Electric Arc., Inc., Newark, N. J.
Smith-Mills—Boilers. Smith Co., Inc., H. B., Westfield, Mass.
Smithway—Motors. Smith Corp., A. O., Eastern Motor Div., Dayton, O.
Smoothcote—Insulation, building. Insulite Div., Minnesota & Ontario Paper Co., Minneapolis, Minn.
Snapin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Snap-Rite—Ducts and duct fittings. Gray Metal Products, Inc., Rochester, N. Y.
Sno-Breze—Air conditioning units, blower wheels. Palmer Mfg. Corp., Phoenix, Ariz.
Snug—Radiation. Weil-McLain Co., Michigan City, Ind.
Sof Tite—Sheets. Wheeling Corrugating Co., Wheeling, W. Va.
Softweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Sola-Flex—Joints. Solar Aircraft Co., San Diego, Calif.
Solar-Flux—Compounds. Solar Aircraft Co., San Diego, Calif.
Solray—Radiation. Weil-McLain Co., Michigan City, Ind.
Sol-vet—Cleaning compounds, water treatment. Anderson-Stolz Corp., Kansas City, Mo.
Solvo-Rust—Solvent. Permatex Co., Inc., Brooklyn, N. Y.
Sonderglass—Glasses. Chesterton Co., A. W., Everett, Mass.
Sonic-Ray—Heaters. Bica Co., Girard, O.
Sonoairduct—Ducts. Sonoco Products Co., Hartsville, S. C.
Sono-O-Seal—Insulation. General Insulating Products Co., Brooklyn, N. Y.
Soundliner—Insulation. Baldwin-Hill Co., Trenton, N. J.
Sound Metal—Noise elimination. Industrial Sound Control, Inc., Hartford, Conn.
Soundscope—Testers. Marsh Instrument Co., Skokie, Ill.
Sound Stream—Insulation. Industrial Sound Control, Inc., Hartford, Conn.
Sound-Zorbers—Vibration absorbers. Finn & Co., Inc., T. R., Hawthorne, N. J.
South Wind—Heaters. Stewart-Warner Corp., Heating Div., Indianapolis, Ind.
Sovabead—Dehumidifiers. Socony-Vacuum Oil Co., Inc., New York, N. Y.
Sovereign—Packing. Darcoid Co., Inc., New York, N. Y.
Space Saver—Heaters. Payne Furnace Div., Affiliated Gas Equipment Inc., Monrovia, Calif.
Spasaver—Cooler units. Drayer-Hanson, Inc., Los Angeles, Calif.
Spartan—Packing, belting. Graton & Knight Co., Worcester, Mass.
Spearhead—Gasket cutters. Zimmerman Packing Co., Cincinnati, O.
Special X—Solder. Industrial Service Laboratories, Milwaukee, Wis.
Speed Clamps—Hose clamps. Tinnerman Products, Inc., Cleveland, O.
Speed Clips—Insulation fasteners. Tinnerman Products, Inc., Cleveland, O.
Spee-Dee—Blue print and white print machines. Peck & Harvey Mfg. Corp., Chicago, Ill.

Speed Drills—Drills. Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago, Ill.
Speed Grinders—Grinders. Speedway Mfg. Co., Div. of Thor Power Tool Co., Chicago.
Speed Grips—Nuts. Tinnerman Products, Inc., Cleveland, O.
Speedheater—Unit heaters. Westinghouse Electric Corp., Sturtevant Div., Boston.
Speedmaster—Blue print machines. Peck & Harvey Mfg. Corp., Chicago, Ill.
Speed Nuts—Locknuts. Tinnerman Products, Inc., Cleveland, O.
Speedomax—Indicator and recorder-controllers, recorders, thermometers. Leeds & Northrup Co., Philadelphia, Pa.
Speed Primer—Pumps. Chain Belt Co., Milwaukee, Wis.
Speed-Rex—Protective coatings. Truscon Laboratories, Detroit, Mich.
Speed-Trol—Changers. Sterling Electric Motors, Inc., Los Angeles, Calif.
Speedweld—Electrodes. Trindl Products, Ltd., Chicago, Ill.
Speedy—Clamps, cutters, extractors, packing, tools, wrenches. Chicago Specialty Mfg. Co., Chicago, Ill.
Speedylectric—Generators, heaters. Livingstone Engineering Co., Worcester, Mass.
Speedyvent—Air eliminators. Livingstone Engineering Co., Worcester, Mass.
Spekaluminite—Coatings. Special Chemicals Corp., Ossining, N. Y.
Spekleen—Compounds. Special Chemicals Corp., Ossining, N. Y.
Sphero—Blow-off valves. Fairbanks Co., New York, N. Y.
Sphinx—Adhesives. Arabol Mfg. Co., New York, N. Y.
Spinner—Gravity ventilators. Warner Ventilator Co., LaGrange, Ind.
Spinner—Ventilators. Inland Steel Products Co., Milwaukee, Wis.
Spin-seat—Steam trap floats. Reichert Float & Mfg. Co., Toledo, O.
Spintex—Building insulation. Johns-Manville, New York, N. Y.
Spiral-Fin—Radiation. Edwards Engineering Corp., Pompton Plains, N. J.
Spiratube—Ducts and duct fittings. Flexible Tubing Corp., Guilford, Conn.
Spiraweld—Pipes. Naylor Pipe Co., Chicago.
Spiro—Heaters. Stout & Sons, David St. Louis, Mo.
Spirodome—Spray nozzles. Fluor Corp., Ltd., The, Los Angeles, Calif.
Spiro-Jet—Gas burners. Thermapanels, Inc., Santa Clara, Calif.
Spirotallic—Gaskets. Johns-Manville, New York, N. Y.
Spirovane—Fans. Western Blower Co., Seattle, Wash.
Spongex—Bases and pads, gaskets, insulation. Sponge Rubber Products Co., The, Shelton, Conn.
Spotaire—Air conditioning units. Drayer-Hanson, Inc., Los Angeles, Calif.
Spraco—Booths, nozzles, separators, strainers, washers. Spray Engineering Co., Somerville, Mass.
Spra-Rite—Nozzles. Binks Mfg. Co., Chicago.
Spray-Acoustic—Insulation. Sprayo Flake Co., Chicago, Ill.
Spraywheel—Air washers. Mountain States Equipment Co., Denver, Colo.
Spring-Cork—Gaskets, tape. Spring Packing Corp., Chicago, Ill.
Spring-Felt—Bases and pads, gaskets, tape. Spring Packing Corp., Chicago, Ill.
Spring-Flex—Absorbers, bases and pads, hangers, hose. Vibration Mounting, Inc., Elmhurst, N. Y.
Springin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Spring-Kote—Adhesives, cement and compounds, insulation. Spring Packing Corp., Chicago, Ill.
Spun steel—Pulleys, sheaves. Mercury Clutch Div., Canton, O.
Square-Heat—Boilers. Kewanee-Ross Corp., Kewanee, Ill.
Stabilflo—Valves. Foxboro Co., Foxboro, Mass.
Stack-Head—Dampers. Air Control Products, Inc., Coopersville, Mich.
Stainlend—Electrodes. Arcos Corp., Philadelphia, Pa.
Stainweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Standard—Ventilators. Burt Mfg. Co., Akron.
Standardaire—High pressure blowers. Read Standard Corp., Blower-Stoker Div., Erie, Pa.
Standforated—Grilles. Standard Stamping & Perforating Co., Chicago, Ill.
Star-O-Zone—Ozone apparatus. Norwood Associated Engineers Inc., Springfield, Mass.
Star-Quality—Nipples. Star Tubular Products Co., Chicago, Ill.
Statick—Ventilators. Hirschman-Pohle Co., Inc., Le Roy, N. Y.
Stat-o-Seal—Gaskets. Wolfe Co., Inc., The, Franklin C., Culver City, Calif.
Staxauster—Roof ventilators. Allen Cooler & Ventilator, Inc., Rochester, Mich.
Staynew—Filters, silencers. Dollinger Corp., Rochester, N. Y.
Stazin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Steamheat—Heating systems, valves. Radiator Valve Co. of America, Philadelphia, Pa.
Steam-Pak—Steam generator unit, heaters. York-Shipley, Inc., York, Pa.
Steelbestos—Metal sheets. American Steel Band Co., Pittsburgh, Pa.
Steelflex—Couplings. Falk Corp., Milwaukee.
Steelweld—Brakes, power shears. Cleveland Crane & Eng. Co., Wickliffe, O.
Steen—Cutters, pipe cleaning machines. Continental Machine Co., Chicago, Ill.
Sterilamp—Lamps. Westinghouse Electric Corp., Lamp Div., Bloomfield, N. J.
Sterlco—Controls, pumps, strainers, regulators, traps, valves. Sterling, Inc., Milwaukee.
Sterling—Compressors, condensers, valves, pipe coils. Reynolds Mfg. Co., Springfield, Mo.
Ster-O-Zone—Ozone apparatus. Norwood Associated Engineers, Inc., Springfield, Mass.
Stictite—Cement, insulation. Refractory & Insulation Corp., New York, N. Y.
Stillson—Wrenches. Walworth Co., New York, N. Y.
Stirling—Boilers. Babcock & Wilcox Co., New York, N. Y.
Stok-A-Fire—Stokers. Automatic Firing Corp., St. Louis, Mo.
Stokerelay—Relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Stokol—Stokers. Eddy Stoker Corp., Chicago.
Stonewall—Board and sheets. Ruberoid Co., New York, N. Y.
Storm Shade—Windows. Ingersoll Products Div., Borg-Warner Corp., Chicago, Ill.
Straitflo—Strainers. Hays Mfg. Co., Erie, Pa.
Streamjet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Streamline—Couplings, cutters, fittings, heat exchangers, manifolds, nipples, pipe, strainers, tubing, unions, valves. Mueller Brass Co., Port Huron, Mich.
Streamlined—Chambers. Green Fire Brick Co., A. P., Mexico, Mo.
Streamliner—Registers. Auer Register Co., Cleveland, O.
Streamliner—Belting. New York Belting & Packing Co., Passaic, N. J.
Stronghold—Belting. Rhoads & Sons, J. E., Philadelphia, Pa.
Studin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Stud-Pak—Insulation. United States Mineral Wool Co., Stanhope, N. J.
Submersion—Boilers, water heaters. Stout & Sons, David, St. Louis, Mo.
Sudden Depth—Drill. Paine Co., Addison, Ill.
Sullivan—Controls. Cole-Sewell Engineering Co., St. Paul, Minn.
Sunair—Heaters. Mission Appliance Corp., Hawthorne, Calif.
Sunrad—Direct radiation, hangers. American Radiator & Standard Sanitary Corp., Pittsburgh, Pa.
Super—Transformers. Union Electric & Mfg. Co., Jersey City, N. J.
Super Air Screws—Fans. Marathon Electric Mfg. Corp., Wausau, Wis.
Supercutno—Packing. Greene, Tweed & Co., North Wales, Pa.
Superector—Wrenches. Williams & Co., J. H., Buffalo, N. Y.
Superex—Pipe, boiler and tank insulation. Johns-Manville, New York, N. Y.
Super-Felt—Insulation. Johns-Manville, New York, N. Y.
Superfin—Furnaces. American Foundry & Furnace Co., Bloomington, Ill.
Super-Fine—Insulation. Libbey-Owens-Ford Glass Co., Toledo, O.
Super Finish—Insulation. Refractory & Insulation Corp., New York, N. Y.
Super-Flo—Dehydrators, filters. Remco, Inc., Zelienople, Pa.
Superflo—Heaters. Payne Furnace Div., Affiliated Gas Equipment Inc., Monrovia, Calif.
Superflux—Solder. Paul-Lewis Laboratories, Inc., Milwaukee, Wis.
Superheat—Gas burners. Selas Corp. of America, Philadelphia, Pa.
Superior—Fans. American Foundry & Furnace Co., Bloomington, Ill.
Superior—Gas fired heaters. Bastian-Morley Co., Inc., LaPorte, Ind.
Super-Power—Drives. Baldwin Belting, Inc., New York, N. Y.
Superratchet—Ratchet Wrenches. Williams & Co., J. H., Buffalo, N. Y.
Superrench—Tools. Williams & Co., J. H., Buffalo, N. Y.
Super-Saw—Tools. R C S Tool Sales Corp., Joliet, Ill.
Superseal—Fittings. Grinnell Co., Inc., Providence, R. I.
Super 7—V belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Super Silvertop—Traps. The V. D. Anderson Co., Cleveland, O.
Super "66"—Insulation. Eagle-Picher Co., Cincinnati, O.
Supersheat—Gaskets. Greene, Tweed & Co., North Wales, Pa.
Super T—Systems. Tork Clock Co., Mount Vernon, N. Y.
Supertan—Leather belting and v-belts. Baldwin Belting, Inc., New York, N. Y.
Supertemp—Insulation. Eagle-Picher Co., Cincinnati, O.
Supertherm—Heating systems. Ross Engineering Corp., J. O., New York, N. Y.
Super Thermo Stucco—Cement. Chicago Fire Brick Co., Chicago, Ill.
Super X—Sheets. Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill.
Super X—Coatings. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Sureclor—Feeders. Paddock Engineering Co., of Texas, Dallas, Tex.
Sure Return—Condensation return pumps. Chicago Pump Co., Chicago, Ill.
Sureweld—Electrodes, welders. National Cylinder Gas Co., Chicago, Ill.
Surfamax—Pipe line filters. Micro Metallic Corp., Glen Cove, N. Y.
Surtec—Compounds. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.
Sweatflow—Valves. Quality Specialty Co., Inc., Camden, N. J.
Sylphon—Steam traps. Webster & Co., Warren, Camden, N. J.
Synchro—Operators, orifices, valves. The Bristol Co., Waterbury, Conn.
Synchro-Flame—Burners. Synchronous Flame, Inc., Walworth, Wis.
Synchro-Lectric—Viscosimeters. Brookfield Engineering Laboratories, Inc., Stoughton, Mass.
Synchro-Meter—Meters. Bailey Meter Co., Cleveland, O.
Synchron—Motors. Hansen Mfg. Co., Inc., Princeton, Ind.
Synchro-Thermetron—Heating systems. Whittington Pump & Engineering Corp., Indianapolis, Ind.
Synchrotie—Recorders. Westinghouse Electric Corp., Pittsburgh, Pa.
Syncretizer—Unit ventilators. Nesbitt, Inc., John J., Philadelphia, Pa.
Syncro—Gages, regulators, combustion control systems. Canton Stoker Corp., Canton, O.
Syncrogear—Speed reducers. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Syndolag—Refractories and refractory cement. Basic Refractories, Inc., Cleveland, O.
Synrub—Wire. United States Rubber Co., New York, N. Y.
Syphonaire—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.

T. N.—Valves. Imperial Brass Mfg. Co., Chicago, Ill.
T. T.—Smoke guns. Hill, E. Vernon & Co., Lake Geneva, Wis.
"TW"—Unit coolers. McQuay, Inc., Minneapolis, Minn.
Tabasco—Water heaters. Kewanee-Ross Corp., Kewanee, Ill.
TAC—Wrenches. Tubing Appliance Company, Inc., Los Angeles, Calif.
Tampin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Tanco—Insulation, duct, sound deadening. Thompson and Co., Oakmont, Pa.
Tank-Kleen—Fuel oil treatment. Celco Corp., New York, N. Y.
Tank-O-Meter—Gages, indicators. Uehling Instrument Co., Paterson, N. J.
Tanktrol—Regulators, sprinkler systems controls. Automatic Control Co., St. Paul.
Tannate—Belting, packing. Rhoads & Sons, J. E., Philadelphia, Pa.
Tannate-Rockwood—Belt drives. Rhoads & Sons, J. E., Philadelphia, Pa.
Taper-Lock—Couplings, V-belt drives, pulleys and sheaves. Dodge Mfg. Corp., Mishawaka, Ind.
Tasil—Furnace cement. Taylor Sons Co., Charles, Cincinnati, O.
Tayco—Furnace and refractory cement, refractories. Taylor Sons Co., Charles, Cincinnati.
Teco-Steel—High temperature paint. Thompson and Co., Oakmont, Pa.
Teel—Pumps, circulators. Dayton Electric Mfg. Co., Chicago, Ill.
TEG—Humidifiers, sterilizing units. National Air Conditioning Inc., Johnstown, Pa.
Teksag Colloid—Boiler cleaning compounds. Agnew & Tomlinson, Long Island City, N. Y.
Tektolog—Recorders. Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Tektor—Switches, alarms. Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.
Tel-A-Pipe—Identification markers for piping. Western Lithograph Co., Los Angeles, Calif.
Telecator—Gages, recorders and recorder-controllers. Automatic Control Co., St. Paul.
Telecode—Relays. Benjamin Electric Mfg. Co., Des Plaines, Ill.
Telemaster—Relays. Tork Clock Co., Inc., Mt. Vernon, N. Y.

Teletrol—Controllers and starters. Airgard Mfg. Co., Chicago, Ill.

Tellevel—Switches. Stephens-Adamson Mfg. Co., Aurora, Ill.

Telsor—Gages. Fielden Instrument Div., Robertshaw-Fulton Controls Co., Philadelphia, Pa.

Teltru—Anemometers, gages. Hill, E. Vernon & Co., Lake Geneva, Wis.

Temflex—Plastic tubing. Irvington Varnish & Insulator Div. of Minnesota Mining & Mfg. Co., Irvington, N. J.

Templok—Insulation. Armstrong Cork Co., Lancaster, Pa.

Tempmaster—Thermostats. Crown Controls Co., Inc., New Bremen, O.

Tempoint—Thermometers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.

Temp-R-izer—Burners. Laharco Industries, Minneapolis, Minn.

Temproof—Bases and pads. Lord Mfg. Co., Erie, Pa.

Tempscribe—Recorders. Bacharach Industrial Instrument Co., Pittsburgh, Pa.

Temptrol—Insulation. Badham Insulation Co., Inc., Birmingham, Ala.

Temtron—Air conditioning units. Ultrasonic Corp., Cambridge, Mass.

Tenite-Kralastic—Plastic pipe. Texas Vitrified Pipe Co., Mineral Wells, Tex.

Tensulate—Insulation. Tennessee Products and Chemical Corp., Nashville, Tenn.

Tergitol—Water treatment. Carbide and Carbon Chemicals Co., A Division of Union Carbide and Carbon Corp., New York, N. Y.

Termin-o-Seal—Seals. Wolfe Co., Inc., The, Franklin C., Culver City, Calif.

Testite—Fittings. General Fittings Co., Providence, R. I.

Texdrive—Pulleys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Texiron—Pullys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Texrope—V-belt drives, pulleys, v-belts. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Texslide—Motor bases. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

TexSteamers—Boilers. Texsteam Corp., Houston, Tex.

Texsteel—Pulleys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

Texolite—Tubing. General Electric Co., Chemical and Metallurgical Div., Pittsfield, Mass.

Texway—Bases. Allis-Chalmers Mfg. Co., Milwaukee, Wis.

T Flow—Valves. Quality Specialty Co., Inc., Camden, N. J.

Tharco—Cement. The Armstrong Co., Detroit.

Thawzone—Dehydrant and acid neutralizer. Highside Chemicals Co., Clifton, N. J.

Thermaflex—Ducts and duct fittings, hose. Flexible Tubing Corp., Guilford, Conn.

Therma Kit—Coils and panels, heaters. Thermapanels, Inc., Santa Clara, Calif.

Therma-Koil—Tubing. Thermapanels, Inc., Santa Clara, Calif.

Thermalbridge—Thermometers. Thompson Research & Mfg. Co., Davenport, Fla.

Thermalink—Heaters, preheaters. Electro-Therm, Inc., Silver Spring, Md.

Thermal Electric—Preheaters, systems. Fluid Systems, Inc., New Haven, Conn.

Thermalfuel—Furnaces. Beck Engineering Combustion Kompany, St. Louis, Mo.

Thermalite—High temperature paint. Tropical Paint & Oil Co., Cleveland, O.

Thermatrol—Valves. Schnacke, Inc., Evansville, Ind.

Thermatube—Pre-insulated pipe. Flexible Tubing Corp., Guilford, Conn.

Thermidaire—Furnaces, heaters. Campbell Heating Co., E. K., Kansas City, Mo.

Thermek—Tubing, aftercoolers, chillers, coils, condensers, coolers, exchangers. Heatron, Inc., York, Pa.

Thermo—Expansion valves. Alco Valve Co., St. Louis, Mo.

Thermo—Heaters. American Furnace Co., St. Louis, Mo.

Thermobank—Systems. Kramer Trenton Co., Trenton, N. J.

Thermo-Base—Air diffusers. Gerwin Industries, Inc., Michigan City, Ind.

Thermobestos—Pipe, boiler and tank insulation. Johns-Manville, New York, N. Y.

Thermochek—Controls. Bell & Gossett Co., Morton Grove, Ill.

Thermodaire—Furnaces, heaters, air conditioning units. Campbell Co., E. K., Kansas City, Mo.

Thermo-Draulik—Regulators. Perfex Corp., Milwaukee, Wis.

Thermodulor—Control systems. Carvell Heat Equipment Co., Los Angeles, Calif.

Thermoflex—Strainers, heating systems, radiator orifices, traps, valves. Cashin Co., W. D., Boston, Mass.

Thermoflex—Radiator orifices. Grinnell Co., Inc., Providence, R. I.

Thermofuel—Furnaces. Beck Engineering Combustion Kompany, St. Louis, Mo.

Thermogas—Furnaces. Beck Engineering Combustion Kompany, St. Louis, Mo.

Thermo Grip—Torches. Ideal Industries, Inc., Sycamore, Ill.

Thermoguide—Thermometers. Taylor Instrument Companies, Rochester, N. Y.

Thermo-Humidigraph — Recorder-controllers. Bristol Co., The, Waterbury, Conn.

Thermoil—Furnaces, unit heaters. Beck Engineering Combustion Kompany, St. Louis.

Thermoilgas—Gas and oil burners. Beck Engineering Combustion Kompany, St. Louis, Mo.

Thermoil-Granodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.

Thermolator—Valves. Triplex Heating Specialty Co., Inc., Peru, Ind.

Thermolier—Unit heaters. Grinnell Co., Inc., Providence, R. I.

Thermopane—Windows. Libbey-Owens-Ford Glass Co., Toledo, O.

Thermoswitch—Thermostats, regulators. Fenwal, Inc., Ashland, Mass.

Therm-o-tile—Conduit. Porter & Co., Inc., H. W., Newark, N. J.

Thermotrade—Electrodes. Eutectic Welding Alloys Corp., Flushing, New York, N. Y.

Therm-otrols—Thermometers. Wheelco Instruments Div., Barber-Colman Co., Rockford, Ill.

Thermovent—Unit ventilators. Nesbitt, Inc., John J., Philadelphia, Pa.

Thermowell—Thermometer wells. Trinity Equipment Corp., Roselle Park, N. J.

Thermwire—Cables, conductors and Panels. Wiegand Co., Edwin L., Pittsburgh, Pa.

Thin Man—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.

Thor—Belting. Goodyear Tire & Rubber Co., Akron, O.

Thorobred cog-belt—V belts and v-belt drives. Dayton Rubber Co., Dayton, O.

Thread-Tite—Cement and compounds. Armite Laboratories, Los Angeles, Calif.

Thredolets—Fittings. Bonney Forge & Tool Wks., Allentown, Pa.

3C—Motor controls. Clark Controller Co., Cleveland, O.

3M—Cements and compounds, adhesives, insulation. Minnesota Mining & Mfg. Co., St. Paul, Minn.

3 Way Weather-Flo—Thermostats. Automatic Devices Co., Inc., Western Springs, Ill.

Thrift Master—Radiation. General Heating Products Co., Philadelphia, Pa.

Thriftymatic—Draft regulators. Engineered Products Co., Philadelphia, Pa.

Throway—Air filters. American Air Filter Co., Inc., Louisville, Ky.

Thur-Ma-Lox—Coatings. Dampney Co., The, Hyde Park, Boston, Mass.

Tico—Galvanized sheet steel. Inland Steel Co., Chicago, Ill.

Tico—Galvanized Sheet Steel. Inland Steel Products Co., Milwaukee, Wis.

Ticosteam—Boilers. Titusville Iron Works Co., The, Titusville, Pa.

Ticotherm—Boilers. Titusville Iron Works Co., The, Titusville, Pa.

Tilt Trap—Steam traps. Nason Co., Clarkston, Mich.

Timercoid—Time switches. Mercoid Corp., Chicago, Ill.

Timerelay — Relays. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Time-O-Stat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.

Tin-Ezy—Coatings, solder and fluxes. Johnson Mfg. Co., Inc., Mt. Vernon, Ia.

Tiny—Traps. Nason Co., Clarkston, Mich.

Titan—Traps. Nason Co., Clarkston, Mich.

Tite Seal—Cement and compounds. Radiator Specialty Co., Charlotte, N. C.

Toastmaster—Heaters. McGraw Electric Co., Chicago, Ill.

Toledo—Steam trap floats. Reichert Float & Mfg. Co., Toledo, O.

Tom Thumb—Pipe machines. Oster Mfg. Co., Cleveland, O.

Toolweld—Electrodes. Lincoln Electric Co., Cleveland, O.

Torchmaster—Torches. Deutsch Co., The, Los Angeles, Calif.

Torchweld—Regulators, valves, welding and cutting apparatus. National Cylinder Gas Co., Chicago, Ill.

Torkflash—Wrenches. Blackhawk Mfg. Co., Milwaukee, Wis.

Tork Master—Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.

Torkotherm—Switches. Tork Clock Co., Inc., Mt. Vernon, N. Y.

Torpedo—Dehydrators, filters, strainers. Imperial Brass Mfg. Co., Chicago, Ill.

Torqometer—Torque indicating wrenches. Snap-on Tools Corp., Kenosha, Wis.

Torq-Stop—Wrenches. Richmont, Inc., San Gabriel, Calif.

Torque-Arm—Reducers. Dodge Mfg. Corp., Mishawaka, Ind.

Torrid—Torches. Polis Mfg. Co., J. D., Chicago, Ill.

Totalume—Paint. Wilbur & Williams Co., Brighton, Mass.

Totrust—Protective coatings, enamels and lacquers. Wilbur & Williams Co., Brighton, Mass.

Trace—Refrigerant leak detectors. Highside Chemicals Co., Clifton, N. J.

Tramrail—Conveyors. Cleveland Tramrail Div., Cleveland Crane & Eng. Co., Wickliffe, O.

Transaire—Transmitters. Taylor Instrument Companies, Rochester, N. Y.

Transflex—Plastic tubing. Irvington Varnish and Insulator Div. of Minnesota Mining and Mfg. Co., Irvington, N. J.

Transite—Conduit, pipe, ducts and duct fittings, refractories, sheets and board. Johns-Manville, New York, N. Y.

Transparent—Analyzers, gages, manometers. Dwyer Mfg. Co., F. W., Chicago, Ill.

Trantex—Adhesives. Johns-Manville, New York, N. Y.

Trap-Dri—Dehydrators. A-P Controls Corp., Milwaukee, Wis.

Trap-it—Filters, strainers. A-P Controls Corp., Milwaukee, Wis.

Tray—Cooling towers. New England Cooling Tower Co., Quincey, Mass.

Treet-O-Control—Steam system and water treatment. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Treet-O-Unit—Feeders, pumps. Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.

Trentweld—Tubing. Crucible Steel Co. of America, Pittsburgh, Pa.

Triad—Stocks and dies. Nye Tool & Machine Co., Chicago, Ill.

Triangle—Water heaters. Day & Night Div., Affiliated Gas Equip., Inc., Monrovia, Calif.

Tri-Clad—Motors. General Electric Co., Apparatus Dept., Schenectady, N. Y.

Trident—Meters. Neptune Meter Co., New York, N. Y.

Tri-Flex—Registers, grilles. Tuttle & Bailey, Inc., New Britain, Conn.

Tri-Flux—Motors. Redmond Co., Inc., Owosso, Mich.

Tri-Flux—Solder. Wolfe-Kote Co., Inc., Sheboygan, Wis.

Tri-Guard—Protective coatings. Foster Co., Benjamin, Philadelphia, Pa.

Trimline—Radiation. Vulcan Radiator Co., Hartford, Conn.

Trimo—Cutters. Armstrong Bros. Tool Co., Chicago, Ill.

Trimo—Pipe wrenches. Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.

Trimo Alloy—Pipe wrenches. Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.

Trimo Spiral Grip—Pipe wrenches. Trimont Mfg. Co., Div. of St. Pierre Chain Corp., Worcester, Mass.

Trimrad—Radiation. Koven & Bro., Inc., L. O., Jersey City, N. J.

Trimtherm—Thermostats. General Controls Co., Glendale, Calif.

Trin-Vue—Sight glasses. Trinity Equipment Corp., Roselle Park, New Jersey

Triple-lok—Fittings. Parker Appliance Co., The, Cleveland, O.

Triple-A—Enamels and lacquers, protective coatings. Quigley Co., Inc., New York.

Triple-Seal—Fittings. Imperial Brass Mfg. Co., Chicago, Ill.

Triplex—Stocks and dies. Nye Tool Co., Chicago, Ill.

Tripl-Mix—Cement. Krehbiel Co., J. H., Chicago, Ill.

Tri-Rotor—Pumps. Yale & Towne Mfg. Co., Stamford, Conn.

Tri-snap—Thermostats. Westinghouse Electric Corp., Pittsburgh, Pa.

Triumph—Gages and indicators. Boston Auto Gage Co., Pittsfield, Mass.

Trojan—Boilers. Burnham Corp., Irvington, N. Y.

Trojan—Stokers. Auburn Burner Co., Auburn, Ind.

Tropelite—Coatings. Tropical Paint & Oil Co., Cleveland, O.

Tropic-Aire—Air conditioning units. McGraw Electric Co., Clark Div., Chicago.

Tropic-Breeze—Air conditioning units. Dalzen Mfg. Co., St. Clair, Mich.

Tropilux—Enamels and lacquers. Tropical Paint & Oil Co., Cleveland, O.

Tru-Air—Air conditioning units, condensers, dehumidifiers, heaters. Blazer, M., & Son, Passaic, N. J.

True-Pitch Levee—Tools. Dreier Bros., Inc., Chicago, Ill.

Truespot—Testers. Bacharach Industrial Instrument Co., Pittsburgh, Pa.

Truflex—Bi-metals. General Plate Div., Metals & Controls Corp., Attleboro, Mass.

Truflex—Drives, V. Belt. Gates Rubber Co., The, Denver, Colo.

Truk-Cel—Unit coolers. Dole Refrigerating Co., Chicago, Ill.

Truliradiant—Gas burners. Gordon & Piatt, Winfield, Kan.

Truliradiant—Gas burners. Sullivan Valve & Engineering Co., Butte, Mont.

Trumark—Protractor for marking pipe. Tru-Line Corp., Los Angeles, Calif.

Tru-Perimeter—Heating systems. Webster & Co., Warren, Camden, N. J.

Tru-Set—Fasteners. Ramset Div., Olin-Mathieson Chemical Corp., Cleveland, O.

Tru-torq—Wrenches. Richmont Inc., Monrovia, Calif.

Try-Me—Regulators, strainers, valves. Tryco Products, Inc., Westfield, Mass.
Tubecote—Protective coatings. Wilhelm Co., A., Reading, Pa.
Tubejet—Compressors, ejector type vacuum pump. Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Tube-Tite—Pipe hangers and supports. Titchener, E. H. & Co., Binghamton, N. Y.
Tuff-Bond—Adhesives, cement, insulation. Moore Inc., Goodloe E., Danville, Ill.
Tufflex—Insulation. Wood Conversion Co., St. Paul, Minn.
Tuf-flex—Gage and sight glasses. Libbey-Owens-Ford Glass Co., Toledo, O.
Tufflite—Pipe. Michigan Plastic Pipe Co., Detroit, Mich.
Tuff-Weld—Fasteners, hangers. Moore Inc., Goodloe E., Danville, Ill.
Tuf-On—Protective coatings. Brooklyn Varnish Mfg. Co., Brooklyn, N. Y.
Tulox—Tubing. Extruded Plastics, Inc., Norwalk, Conn.
Tumblin—Bolts. Star Expansion Bolt Co., New York, N. Y.
Tungweld—Electrodes. Lincoln Electric Co., The, Cleveland, O.
Turbinair—Motors. Joy Mfg. Co., Pittsburgh, Pa.
Turbine Driven—Heaters. Wing Mfg. Co., L. J., New York, N. Y.
Turbo—Air washers, spray nozzles. Bayley Blower Co., Milwaukee, Wis.
Turbo-Aire—Overfire air jets. Canton Stoker Corp., Canton, O.
Turb-Flo—Water chillers. Drayer-Hanson, Inc., Los Angeles, Calif.
Turbo Vane—Fans and blowers. Westinghouse Electric Corp., Sturtevant Div., Boston, Mass.
Turbulaire—Dryers. Western Precipitation Corp., Los Angeles, Calif.
Turcoat—Coatings. Turco Products, Inc., Los Angeles, Calif.
Turret—Pumps. Yeomans Bros. Co., Melrose Park, Ill.
Tu-way—Radiation. Brown Products Co., Forest Hills, N. Y.
20th Century—Bearings. Roller Bearing Co., of America, West Trenton, N. J.
Twin Contact—Controls, switches, thermostats. Perfex Corp., Milwaukee, Wis.
Twindow—Heat insulating windows. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Twindoweld—Heat insulating windows. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Twin-Flow—Cooling towers. Marley Co., The, Kansas City, Mo.
Twin G-Fin—Preheaters. Griscom-Russell Co., The, Massillon, O.
Twin-Line—Pumps. Cooper-Bessemer Corp., The, Mt. Vernon, O.
Twin Seal—Check valves, gage testers. Mansfield & Green, Cleveland, O.
2-in-1—Sealing compounds. Utility Laboratory, Inc., Brooklyn, N. Y.
Two-Tank-T—Oil burner filters. Barclay, Inc., Robert, Chicago, Ill.
Tygon—Protective coatings, plastic tubing. U. S. Stoneware Co., New York, N. Y.
Tylox—Pipe couplings. United States Stoneware Co., New York, N. Y.
Tymit—Switches. Tork Clock Co.; Inc., Mt. Vernon, N. Y.

U S—Fittings, flanges, tank plugs. U. S. Plug & Fitting Co., Wellington, O.
U. S.—Heaters. United States Radiator Corp., Detroit, Mich.
US-Capitol—Boilers, hangers or brackets, heaters, radiation. United States Radiator Corp., Detroit, Mich.
US-Capitolaire—Air conditioning units, furnaces. United States Radiator Corp., Detroit, Mich.
U. S. Fin-Ray—Radiation. United States Radiator Corp., Detroit, Mich.
USG—Louvers and shutters. United States Gypsum Co., Chicago, Ill.
U. S. Radiant Baseboard—Radiation. United States Radiator Corp., Detroit, Mich.
U. S. S.—Angles, sheets. United States Steel Co., Pittsburgh, Pa.
U. S. S.—Pipe, tubing. National Tube Div., United States Steel Corp., Pittsburgh, Pa.
U-S-S—Sheets, angles. Columbia-Geneva Steel Div., United States Steel Corp., San Francisco, Calif.
USS—Sheets. Tennessee Coal, Iron & Railroad Co., United States Steel Corp. Subsidiary, Birmingham, Ala.
U. S. Solar Flame—Oil burners. United States Radiator Corp., Detroit, Mich.
U. S. Sunray—Radiation. United States Radiator Corp., Detroit, Mich.
U. S. Thin Tube—Radiation. United States Radiator Corp., Detroit, Mich.
U. S. White Star—Valves. Powell Co., Wm., The, Cincinnati, O.
Ucilon—Protective coatings, high temperature paint. United Chromium, Inc., New York.
U-Cote—Pipe fittings. Union Malleable Mfg. Co., Ashland, O.
Ugasco—Gaskets. United States Gasket Co., Camden, N. J.
U-Loy—Sheets. Republic Steel Corp., Cleveland, O.
Ultra-Aire—Filters. Mine Safety Appliances Co., Pittsburgh, Pa.
Ultrafine—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Ultralite—Insulation. Gustin-Bacon Mfg. Co., Kansas City, Mo.
Ultra-Viscoson — Viscosimeters. Rich-Roth Laboratories, East Hartford, Conn.
Unaflow—Steam engines. Ames Iron Works, Div. of Pierce Butler Radiator Corp., Oswego, N. Y.
Unarco—Insulation, gaskets, packing, Insulating cement, condensers, heaters, radiation, surface cooling & heating, towers, air conditioning units. Union Asbestos & Rubber Co., Chicago, Ill.
Unbrako—Repair plugs, screws. Standard Pressed Steel Co., Jenkintown, Pa.
Unibestos—Insulation. Union Asbestos & Rubber Co., Chicago, Ill.
Uni-cast—Motors. Redmond Co., Inc., Owosso, Mich.
Unichrome—Enamels and lacquers, protective coatings. United Chromium Inc., New York.
Uniclosed—Electric motors. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Unicoils—Finned surfaces. Clarage Fan Co., Kalamazoo, Mich.
Unicon—Refrigerating condensers. Kramer Trenton Co., Trenton, N. J.
Uniduct—Ducts and duct fittings. General Corporation, Minneapolis, Minn.
Uni-fin—Registers, regulators. Barber-Colman Co., Rockford, Ill.
Uniflare—Fittings. Scovill Mfg. Co., Waterbury, Conn.
Uniflex—Metal hose. Brockway Co., Naugatuck, Conn.
Uni-flo—Diffusers, grilles, registers. Barber-Colman Co., Rockford, Ill.
Uniflow—Oil burners. Ace Engineering Co., Chicago, Ill.
Uniloy—Steel sheets. Universal-Cyclops Steel Corp., Bridgeville, Pa.
Union—Valves. Powell Co., Wm., The, Cincinnati, O.
Unipack—Welding fume exhausters, centrifugal fans. American Machine Products Co., Marshalltown, Ia.
Uni-Pull—Flat belt drives. Rhoads & Sons, J. E., Philadelphia, Pa.
Unipump—Pumps. Weinman Pump Mfg. Co., Columbus, O.
Unishears—Electric shears. Stanley Electric Tools, Div. of The Stanley Works, New Britain, Conn.
Unisorb—Bases and pads. Felters Company, The, Boston, Mass.
Unistage—Aftercoolers. Schramm, Inc., West Chester, Pa.
Unitair—Air compressors. Joy Mfg. Co., Pittsburgh, Pa.
Unitaire—Air conditioning units. Westinghouse Electric Corp., Air Conditioning Div., Staunton, Va.
Unitem—Heaters. Bell & Gossett Co., Morton Grove, Ill.
Unitherm—Unit heaters. Clarage Fan Co., Kalamazoo, Mich.
Unitite—Valves. Hanna Engineering Wks., Chicago, Ill.
Unit-Line—Pumps. Johnston Pump Co., Pasadena, Calif.
UniTrane—Air conditioning units and coolers. Trane Co., The, La Crosse, Wis.
Unitype—Pumps. Pacific Pumping Co., Oakland, Calif.
Universal—Benders. Hossfeld Mfg. Co., Winona, Minn.
Universal Burners. Dalzen Mfg. Co., St. Clair, Mich.
Universal—Cast iron pipe. Central Foundry Co., Newark, N. J.
Universal—Centrifugal pumps. Bell & Gossett Co., Morton Grove, Ill.
Universal—Gas and oil burners. Mettler Co., Inc., The, Los Angeles, Calif.
Universal—Packing. Johns-Manville, New York, N. Y.
Universal—Pipe cutters. Nye Tool Co., Chicago, Ill.
Universal—Pumps, air conditioning units. Wright Mfg. Co., Phoenix, Ariz.
Universal—Regulators. Dockson Corp., Detroit, Mich.
Universal Unaflow—Engines. Skinner Engine Co., Erie, Pa.
Uni-Wash—Dust collectors. Newcomb-Detroit Co., Detroit, Mich.
Uno Turbine—Ventilators. Uno Ventilator Co., Malden, Mass.
Uno Venturette—Ventilators. Uno Ventilator Co., Malden, Mass.
Upson—Bolts and studs. Republic Steel Corp., Bolt & Nut Div., Cleveland, O.
Urefoam—Insulating cement, pipe insulation. Atlas Mineral Products Co., Mertztown, Pa.
UsAIRco—Air conditioning equipment, blowers, condensers, fans, heaters. United States Air Conditioning Corp., Minneapolis, Minn.
Uskon—Conductors. United States Rubber Co., New York, N. Y.
Utilitube.—Aluminum tubing. Aluminum Co. of America, Pittsburgh.
Utility—Blowers. American Blower Corp., Detroit, Mich.
Utility—Roof ventilators. Arex Co., Chicago.
Utility—Heaters. Wing Mfg. Co., L. J., New York, N. Y.

V*S—Changers. Reliance Electric & Engineering Co., Cleveland, O.
Vacumatic—Ejectors, pumps. Whittington Pump & Engineering Corp., Indianapolis.
Vacu-Flo—Fittings. H-P Products, Inc., Louisville, O.
Vacuumstat—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Vad—Cooling towers. Young Radiator Co., Racine, Wis.
Valcalox—Damper regulators. Young Regulator Co., Cleveland, O.
Valdura—Paint. American-Marietta Co., Chicago, Ill.
Valvactor—Valve operators. Foxboro Co., Foxboro, Mass.
Valvent—Roof ventilators, Stwartwout Co., Cleveland, O.
Valvrator—Valves. Fischer & Porter Co., Hatboro, Pa.
Vane-O-Line—Registers. Louvra Corp., The, Union, N. J.
Vane-Runner—Vanes. Duro-Dyne Corp., Hempstead L. I., N. Y.
Vape-Sorber—Filters, Selas Corp. of America, Philadelphia, Pa.
Vaporene—Corrosion inhibition. Metropolitan Refining Co., Inc., Long Island City, N. Y.
Vapor-Clarkson—Heating and process boilers. Vapor Heating Corp., Chicago, Ill.
Vaporstat—Switches. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Va-pur-izer—Room type unit humidifiers. Crowell & Dunn, Inc., New York, N. Y.
Varidrive—Speed changers. U. S. Electrical Motors, Inc., Los Angeles, Calif.
Vari-Pitch—Speed changers, pulleys and sheaves. Allis-Chalmers Mfg. Co., Milwaukee, Wis.
Vari-Temp—Air conditioning units. Dunham Co., C. A., Chicago, Ill.
Vari-Vac—Heating systems. Dunham Co., C. A. Chicago, Ill.
Vari-Vent—Valves. Dole Valve Co., Chicago.
Vaultmaster—Air conditioning units. Haertel Co., Walter, Minneapolis, Minn.
Veco—Analyzers, combustion testing kits,Recorders, testers. Victory Engineering Corp., Union, N. J.
Veeco—Leak detectors. Vacuum-Electronic Engineering Co., New Hyde Park, L. I.
Vee Jet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Veelos—V-belts. Manheim Mfg. & Belting Co., Manheim, Pa.
Velometer—Air velocity meters, anemometers Illinois Testing Laboratories, Inc., Chicago.
Ventalarm—Alarms, gages. Scully Signal Co., Melrose, Mass.
Ventlab—Connections, duct, flexible. Ventfabrics, Inc., Chicago, Ill.
Ventglas—Connections, duct, flexible. Ventfabrics, Inc., Chicago, Ill.
Vento—Traps. Haines & Co., Inc., William S., Div. Sellers Injector Corp., Philadelphia.
Vent-Rite—Air valves. Anderson Products, Inc., Cambridge, Mass.
Ventube—Ducts and duct fittings. E. I. du Pont de Nemours & Co., Inc., Fabrics & Finishes Dept., Wilmington, Del.
Ventura—Fans. American Blower Corp., Detroit, Mich.
Venturafin—Unit heaters. American Blower Corp., Detroit, Mich.
Venturi—Fan housings. Commercial Shearing & Stamping Co., Youngstown, O.
Venturi—Meters, nozzles. Builders-Providence, Inc., Div. of B-I-F Industries Inc., Providence, R. I.
Venturi-Flo—Air diffusers. Barber-Colman Co., Rockford, Ill.
Venturi One—Fittings. Taco Heaters, Inc., Cranston, R. I.
Vent-Vac—Heating systems. Anderson Products, Inc., Cambridge, Mass.
Ventyvinyl—Connections. Ventfabrics, Inc., Chicago, Ill.
Verco—Insulating cement. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Vercoustic—Insulation. Nelson Mfg. Co., B. F., Minneapolis, Minn.
Verithin-Microrold—Steel sheets. Washington Steel Corp., Washington, Pa.
Vermiculite—Insulation. International Vermiculite Co., Girard, Ill.
Vernier-Set—Time switches. Automatic Temperature Control Co., Inc., Philadelphia, Pa.
Vertical—Unit heaters. American Blower Corp., Detroit, Mich.
Vertiflow—Unit heaters. Young Radiator Co., Racine, Wis.
V-Flat—Pulleys and sheaves. Dayton Rubber Co., Dayton, O.

Vibracork—Bases and pads. Korfund Co., Inc., Long Island City, N. Y.
Vibraglass—Bases and pads. Glass Fibers, Inc., Toledo, O.
Vibrasafe—Absorbers. Pleasantaire Corp., Washington, D. C.
Vibrashock—Bases and pads. Robinson Aviation, Inc., Vibrashock Div. Teterboro, N. J.
Vibra-sorber—Vibration absorbers. Flexonics Corp., Maywood, Ill.
Vibro-Hangers. Pipe hangers and supports. Korfund Co., Inc., Long Island City, N. Y.
Vibro Insulators—Bases. Goodrich Co., B. F., Akron, O.
Vibro-Isolator—Bases and pads. Korfund Co., Inc., Long Island City, N. Y.
Vichrome—Coatings, enamels. Interchemical Corp., Finishes Div., Newark, N. J.
Vic-O-Seal—Gaskets. Vickers, Inc., Div. of Sperry Corp., El Segundo, Calif.
Victory—Registers. Register & Grille Mfg. Co., Inc., Brooklyn, N. Y.
V-in-Tah—Paint. American-Marietta Co., Chicago, Ill.
Vim—Belting, gaskets, leather packing. Houghton & Co., E. F., Philadelphia, Pa.
Vim Tred—Leather belting. Houghton & Co., E. F., Philadelphia, Pa.
Vinsynite—Coatings. Thompson and Co., Oakmont, Pa.
Vinyl—Coatings. Gates Engineering Co., Wilmington, Del.
Vinyl—Protective coatings. Watson-Standard Co., Pittsburgh, Pa.
Visaflame—Controls. Mercoid Corp., The, Chicago, Ill.
Visco—Preheaters. Crotty Mfg. Corp., Long Island, N. Y.
Viscorator—Viscosimeters. Fischer & Porter Co., Hatboro, Pa.
Visi Flo—Sight glasses. O P W Corp., Cincinnati, O.
Visi—Float. Air filter gages. F. W. Dwyer Mfg. Co., Chicago.
Visoleak—Leak detectors. Allin Mfg. Co., Chicago, Ill.
Vistand—Vise stands. Armstrong Mfg. Co., Bridgeport, Conn.
Vitalloy—Wrenches. Billings & Spencer Co., Hartford, Conn.
Vitreon—Pipe. Robinson Clay Product Co., Inc., The, Akron, O.
Vitricel—Refractories. Carey Mfg. Co., Philip, The, Lockland, Cinncinnati, O.
Vitriram—Furnace cement. U. S. Stoneware Co., New York, N. Y.
Vix-Syn—Rubber and synthetic packing. Houghton & Co., E. F., Philadelphia, Pa.
V-Meth-L—Refrigerants. Virginia Smelting Co., West Norfolk, Va.
Volcano—Ventilators. Iwan Brothers, South Bend, Ind.
Volcano—Torches. Deutsch Co., The, Los Angeles, Calif.
Vol-O-Flo—Meters. National Instrument Laboratories, Inc., Riverdale, Md.
Voriflow—Burners. Orr & Sembower, Inc., Reading, Pa.
Vornado—Fans, motors, air conditioning units. Sutton Corp., O. A., The, Wichita, Kans.
Vortex—Pumps. Lawrence Pump & Engine Co., Lawrence, Mass.
Vortex—Nozzles. Phillips Cooling Tower Co., Inc., Brooklyn, N. Y.
V-to-V—Pulleys and sheaves. Dayton Rubber Co., Dayton, O.
Vulcalock—Fittings, pipe, tanks, valves. Good rich Co., B. F., Akron, O.
Vulcan—Stands, tongs, vises. Williams & Co., J. H., Buffalo, N. Y.
Vulcan—Stokers. Canton Stoker Corp., Canton, O.
Vulcan-Hartford—Heating surface. Vulcan Radiator Co., Hartford, Conn.
Vulcan Superior—Tongs, vises. Williams & Co., J. H., Buffalo, N. Y.
Vulco—Belts, drives, pulleys. Gates Rubber Co., Denver, Colo.
Vulcomount—Pulleys. Gates Rubber Co., Denver, Colo.

W. & McD.—Strainers. Watson & McDaniel Co., Philadelphia, Pa.
W-S—Fittings. Watson-Stillman Fittings Div., H. K. Porter Co., Inc., Roselle, N. J.
W & T—Anemometers, feeders, gages, indicators, hygrometers, dew point recorders, meters, relays. Wallace & Tiernan Co., Inc., Newark, N. J.
W.T.E.—Boilers. Murray Iron Works Co., Burlington, Ia.
WTP—Boilers. Titusville Iron Wks., Co., The, Titusville, Pa.
W & W—Pipe hangers. Western Wire Products Co., St. Louis, Mo.
Wakefield—Coils, fittings, pipe, pumps, tanks and valves. Lead Lined Iron Pipe Co., Wakefield, Mass.
Walco-Parmelee—Wrenches. Walworth Co., New York, N. Y.
Walltube—Radiator brackets. Arjac Products Inc., Rochester, N. Y.
Walseal—Fittings, valves. Walworth Co., New York, N. Y.
Walvector—Radiations. Webster & Co., Warren, Camden, N. J.
Warco—Combustion chambers, refractories. Walsh Refractories Corp., St. Louis, Mo.
Warco—Valves. Bridgeport Brass Co., Bridgeport, Conn.
Warco—Fuel oil treatment. Warren Refining & Chemical Co., The, Cleveland, O.
Warcolite—Enamels and lacquers. Warren Refining & Chemical Co., The, Cleveland.
Warnock—Wrenches. Lowell Wrench Co., Worcester, Mass.
Wat-a-mat—Water meters. Pfening Co., Fred D., Columbus, O.
Watch Dog—Meters. Worthington-Gamon Meter Div., Worthington Corp., Newark, N. J.
Watco—Cooling towers, humidifiers, spray nozzles, spraying systems. Water Cooling Corp., New York, N. Y.
Water-Boy—Feeders, alarms, valves. Maid-O'-Mist, Inc., Chicago, Ill.
Waterfilm—Boilers. Koven & Bros., L. O., Inc., Jersey City, N. J.
Water-King—Pumps. Peerless Pump Div., Food Machinery and Chemical Corp., Los Angeles, Calif.
Water-Maker—Water heaters. Catskill Metal Works, Inc., Catskill, N. Y.
Water-Mund—Heaters. Mund Boilers, Inc., Los Angeles, Calif.
Waterspar—Enamels and lacquers. Pittsburgh Plate Glass Co., Pittsburgh, Pa.
Wa-Trol—Regulators. Thermal Agency, Houston, Tex.
Way Loctor—Doors and panels. Walsh, The, L. M., Co., Boston, Mass.
Wear-Proof—Pumps. Schneible Co., Claude B., Detroit, Mich.
Wearweld—Electrodes. Lincoln Electric Co., Cleveland, O.
Weather—Protective coatings. Minnesota Mining & Mfg. Co., St. Paul, Minn.
Weather-Damper—Regulators. Automatic Devices Co., Inc., Western Springs, Ill.
Weather-Flo—Thermostats, control systems, regulators. Automatic Devices Co., Inc., Western Springs, Ill.
Weathermaker—Unit air conditioners. Carrier Corp., Syracuse, N. Y.
Weather-Man—Regulators, switches, thermostats, control systems. Automatic Devices Co., Inc., Western Springs, Ill.
Weatherstat—Thermostats. Minneapolis-Honeywell Regulator Co., Minneapolis, Minn.
Webco—Brakes. Webb Machine & Tool Co., Imperial, Pa.
Weber's—Forty-Eight Insulations, Inc., Aurora, Ill.
Webster-Nesbitt—Unit heaters. Webster & Co., Warren, Camden, N. J.
Webster-Nesbitt "Little Giant"—Unit heaters. Nesbitt, Inc., John J., Philadelphia, Pa.
Webster Ross—Pipe joints. Webster & Co., Warren, Camden, N. J.
Weco—Gas burners. Webster Engineering Co., Tulsa, Okla.
Weco—Plugs, steel unions. Cheksan Co., Brea, Calif.
Wedgbelt—V belts and v-belt drives, pulleys. American Pulley Co., Philadelphia, Pa.
Wee Scot—Boilers. Titusville Iron Works Co., The, Titusville, Pa.
Weir—Stokers. Meyer Furnace Co., The, Peoria, Ill.
Weiralead—Lead alloy coated sheets. Weirton Steel Co., Weirton, W. Va.
Weir-Meyer—Furnaces. Meyer Furnace Co., The, Peoria, Ill.
Weirzin—Electrolytic zinc coated sheets. Weirton Steel Co., Weirton, W. Va.
Weldaluminite—Welding compounds. Special Chemicals Corp., Ossining, N. Y.
Weldells—Welding fittings. Taylor Forge & Pipe Works, Chicago, Ill.
Weld-Ends—Couplings. Wachs Co., E. H., The, Chicago, Ill.
Weld-Ends—Pipe couplings, fittings. Pipeline Development Co., Cleveland, O.
Weldolets—Fittings. Bonney Forge & Tool Works, Allentown, Pa.
Wellite—Insulation. International Insulations, Inc., New York, N. Y.
WesCo—Solenoids. West Coast Electric Mfg. Co., Los Angeles, Calif.
Western—Fans, furnaces, heaters. International Sales Co., San Francisco, Calif.
Western—Ventilators. Western Engineering & Mfg. Co., Venice, Calif.
Westernaire—Fans. Western Engineering & Mfg. Co., Venice, Calif.
Western Roll-Bond—Heat exchangers. Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill.
West-Flex—Bellows, hose. Flexible Metal Hose Mfg. Co., Costa Mesa, Calif.
Westo—Water treatment. Western Chemical Co., Kansas City, Mo.
Wheeler-Economy—Ejectors, pumps. Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., Philadelphia, Pa.
Whirlcone—Spray nozzles. Water Cooling Equipment Co., St. Louis, Mo.
Whirljet—Spray nozzles. Spraying Systems Co., Bellwood, Ill.
Whisper-Quiet—Heaters. Zink Co., John, Tulsa, Okla.
White Star—Valves. Powell Co., Wm., The, Cincinnati, O.
Whitson—Steam traps. Healy Ruff Co., St. Paul, Minn.
Wig-O-Flex—Couplings. Wiggins Oil Tool Co., Inc., E. B., Los Angeles, Calif.
Wigwam Thermcap—Vent flue caps. Boston Machine Works Co., Lynn, Mass.
Wilco—Bi-metals. Wilson Co., H. A., The, Union, N. J.
Wilco—Pipe cutting machines. Oster Mfg. Co., Cleveland, O.
Will-Cool—Oil coolers. Taco Heaters, Inc., Cranston, R. I.
Williams-Hager—Valves. Williams Gauge Co., Inc., The, Pittsburgh, Pa.
Wilmington—Air compressors. Electric Sprayit Co., The, Sheboygan, Wis.
Windial—Anemometers. Friez Instrument Div., Bendix Aviation Corp., Baltimore.
Windmaker—Fans. Rich Fan Mfg. Co., Inc., Phil, Houston, Tex.
Wind-O-Cool—Fans. Belco Industries, Inc., St. Louis, Mo.
Wind-O-Vent—Window ventilator and filter units. Reed Unit-Fans, Inc., New Orleans.
Wingfoil—Ventilators, exhausters. Wing Mfg. Co., L. J., Linden, N. J.
Winkler—Burners, furnace, stokers, units. Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Winter-Chaser—Air conditioning units, furnaces, heaters. Campbell Heating Co., Des Moines, Ia.
Wissco—Grilles. Wickwire Spencer Steel Div. of Colorado Fuel & Iron Corp., New York, N. Y.
Witch—Bolts, clamps, hangers, protectors. Carpenter & Paterson, Inc., Cambridge, Mass.
Wolfe-Linde—Condensers, fittings, valves. Dersch, Gesswein & Neuert, Inc., Chicago.
Wonder—Tubing benders. American Pipe Bending Machine Co., Inc., Poultney, Vt.
Wondaire—Heaters. Cox Mfg. Co., Ridgeville, Ind.
Wovenstone—Pipe insulation. Union Asbestos & Rubber Co., Cicero, Ill.
Wrap-On—Pipe insulation, electric cable. Wrap-On Co., Chicago, Ill.
Wurtzilite—Coatings. Ohmlac Paint & Refining Co., Inc., Long Island City, N. Y.

X-L—Gaskets, packing. Excelsior Leather Washer Co., Rockford, Ill.
Xacto—Meters. Bowser, Inc., Fort Wayne, Ind.
"X" Boilerliquid—Compounds. X Laboratories, Inc., New York, N. Y.
"X" Flush-Rustoff—Boiler cleaning compounds. X Laboratories, Inc., New York.
"X" Pipecut Oil—Cutting oil. X Laboratories Inc., New York, N. Y.
"X" Pipejoin—Cement and compounds. X Laboratories, Inc., New York, N. Y.
Xit—Ventilators. Iona Ventilator Co., Inc., Philadelphia, Pa.

YAC—Air conditioning units. Young Radiator Co., Racine, Wis.
Yager's—Solder. Benson Co., Inc., Alex R., Hudson, N. Y.
Yarway—Alarms, clamps, expansion joints, recorders, nozzles, strainers, traps, valves. Yarnall-Waring Co., Philadelphia, Pa.
Yoloy—Pipe, sheet, tubing. Youngstown Sheet & Tube Co., Youngstown, O.
Yorkaire—Unit air coolers. York Corp., York, Pa.
York-Power—Oil burners. York-Shipley, Inc., York, Pa.
Yulatrol—Fuel oil preheaters. Yula Water Heaters, Inc., New York, N. Y.

Zaflo—Enamels and lacquers. Atlas Powder Co., North Chicago, Ill.
Zaponite—Enamels and lacquers. Atlas Powder Co., North Chicago, Ill.
Zatex—Enamels and lacquers. Atlas Powder Co., North Chicago, Ill.
Z-Crete—Pipe insulation. Zonolite Co., Chicago, Ill.
Zephyrweld—Pipe fittings. Tri-Clover Machine Co., Kenosha, Wis.
Zerex—Anti-freeze compounds. du Pont de Nemours & Co., E. I., Polychemicals Dept., Wilmington, Del.
Zero—Cement, refractories. Standard Fuel Engineering Co., Detroit, Mich.
Zero—Pipe insulation. Johns-Manville, New York, N. Y.
Zerolite—Pipe insulation. Johns-Manville, New York, N. Y.
Zeropaks—Coolers. McQuay, Inc., Minneapolis, Minn.
Zig Zag—Heat exchangers. Stout & Sons, David, St. Louis, Mo.
Zinaloy—Zinc sheets. Matthiessen & Hegeler Zinc Co., La Salle, Ill.

Zincgrip—Sheets. Armco Steel Corp., Middletown, O.
Zincilate—Coatings. Industrial Metal Protectives, Inc., Dayton, O.
Zinc Soot—Soot destroyers. Tamms Industries Inc., Chicago, Ill.
Zinodine—Protective coatings. American Chemical Paint Co., Ambler, Pa.
Zipper—Welders. Mid-States Welder Mfg. Co., Chicago, Ill.
Zircon—Furnace and refractory cement, refractories. Taylor Sons Co., Charles, Cincinnati, O.
Zone-Master—Heating systems. General Heaters & Regulators Co., East Chicago, Ind.
Zone-Pac—Heating systems. Barber-Colman Co., Rockford, Ill.
Zonetrol—Systems. Acro Mfg. Co., The, Columbus, O.

DIRECTORY SECTION

HEATING, PIPING, AND AIR CONDITIONING EQUIPMENT FOR INDUSTRY AND LARGE BUILDINGS

PART 4—ALL MANUFACTURERS' ADDRESSES

A

A. & A. Register Co., 8327 Clinton Rd., Cleveland 9, O.
ACEC Electric Corp., 40 E. 29th St., New York 17, N. Y.
A'G'A Div. of Elastic Stop Nut Corp. of America, 1027 Newark Ave., Elizabeth 3, N. J.
A-J Mfg. Co., 2119 Washington St., Kansas City 8, Mo.
A-P Controls Corp., 2450 N. 32nd St., Milwaukee 45, Wis.
A.R.A. Mfg. Co., 104 Foch St., Ft. Worth, Tex.
Abart Gear & Machine Co., 4828-36 W. 16th St., Chicago 50, Ill.
Abbeon Supply Co., 179-15 Jamaica Ave., Jamaica, N. Y.
Abbott & Biddle Co., 2413-27 Federal St., Philadelphia 46, Pa.
Able Metal Spinning & Stamping Co., 126 LaFayette St., New York 13, N. Y.
Acadia Synthetic Products Div., Western Felt Works, 4115 Ogden Ave., Chicago, Ill.
Accurate Sheet Metal Mfg. Works, 2336-40 Milwaukee Ave., Chicago
Ace Engineering Co., 1435 W. 15th St., Chicago 8, Ill.
Ace Instrument Co., Inc., 172 Pacific St., Brooklyn, N. Y.
Acer & Whedon, Inc., Medina, N. Y.
Acheson Mfg. Co., Braddock P. O., Rankin, Pa.
Acker Organization, Inc., W. M., 2430 Poplar Springs, Meridan, Miss.
Askermann Mfg. Co., Wheeling, W. Va.
Acme Asbestos Covering & Flooring Co., 236 N. Elizabeth St., Chicago 7, Ill.
Acme Electric Corp., Cuba, N. Y.
Acme Electric Welder Co., 2618 Fruitland Ave., Los Angeles 58, Calif.
Acme Equipment Co., 205-13 E. Broadway, Muskogee, Okla.
Acme Industries, Inc., Cor. Mechanic St., Jackson, Mich.
Acme Mfg. Co., 7500 State Rd., Holmesburg, Philadelphia 36, Pa.
Acme Steel Co., 2840 Archer Ave., Chicago 8, Ill.
Acorn Refining Co., 8001 Franklin Ave., Cleveland, O.
Acragage Corp., Wampus Lane, Milford, Conn.
Acro Mfg. Co., The, 2040 E. Main St., Columbus, O.
Acro Welder Mfg. Co., 1825 W. St. Paul Ave., Milwaukee 3, Wis.
Adam Electric Co., Frank, 3650 Windsor St., St. Louis, Mo.
Adams Co., The, E. 4th St., P. O. Box 268, Dubuque, Ia.
Adams Co., Inc., R. P., 225-7 E. Park Dr., Buffalo 17, N. Y.
Adams Mfg. Co., 1530 St. Clair Ave., Cleveland 14, O.
Adams Pipe Repair Products, 2453 Merced Ave., P. O. Box 21, El Monte, Calif.
Addison Products Co., Addison, Mich.
Adelta Mfg. Co., Inc., 21 & Ellsworth, Philadelphia 46, Pa.
Adjustable Clamp Co., 417 N. Ashland Ave., Chicago 22, Ill.
Admiral Corp., 3800 Cortland St., Chicago 47, Ill.
Advance Aluminum Castings Corp., 2742 W. 36th Pl., Chicago 32, Ill.
Advance Electric & Relay Co., 2435 N. Naomi St., Burbank, Calif.
Advance Pump Co., 2531 9th St., Berkeley, Calif.
Aerco Corp., Northvale, N. J.
Aero-Coupling Corp., 3015 Winona Ave., Burbank, Calif.
Aerofin Corp., 101 Greenway Ave., Syracuse 1, N. Y.
Aeroil Products Co., Inc., Wesley St., South Hackensack, N. J.
Aeroquip Corp., 300 S. East Ave., Jackson, Mich.
Aerotec Corp., The, Greenwich, Conn.
Aerovent Fan Co., Inc., Ash and Barlow Sts., Piqua, O.
Agava Products, Inc., 34 Exchange Pl., Jersey City 2, N. J.
Aget-Detroit Co., 613 First National Bldg., Ann Arbor, Mich.
Agnew & Tomlinson, 51-04 Vernon Blvd., Long Island City 1, N. Y.
Ahlberg Bearing Co., 3081 W. 47th St., Chicago 32, Ill.
Air-Aid Corp., 791 Tremont St., Boston 18, Mass.
Air Conditioning Engineering Co., 44 First St., Cambridge 41, Mass.
Air Conditioning Products Co., 2340 W. Lafayette Blvd., Detroit 16.
Air Control Products, Inc., Coopersville, Mich.
Air Controls, Inc., Div. of Cleveland Heater Co., 2310 Superior Ave., Cleveland 14, O.
Air Conversion Research Corp., 4107 N. Damen Ave., Chicago 18, Ill.
Air-Cooling Engineering Co., P. O. Box 744, Evanston, Ill.
Aircraft Fitting Co., 1400 E. 30 St., Cleveland 14, O.
Air Devices, Inc., 185 Madison Ave., New York 16, N. Y.
Air Equipment Co., 1713 W. Carroll Ave., Chicago 12, Ill.
Air Equipment Co., 2730 Zuni St., Denver, Colo.
Air-Factors, Inc., 1624 S. Raymond Ave., Monrovia, Calif.
Air Filter Corp., 108 N. Water St., Milwaukee 2, Wis.
Airlenco, Inc., 198 Wayne St., Mansfield, O.
Air Reduction Sales Co., Div. of Air Reduction Co., Inc., 60 E. 42nd St., New York 17, N. Y.
Air & Refrigeration Corp., 439 Madison Ave., New York 22, N. Y.
Aireactor Corp., 22 E. 40th St., New York 16, N. Y.
Aire-Foile Fan & Blower Co., 2909 Central Ave., Detroit 9, Mich.
Airgard Mfg. Co., 362 W. Erie St., Chicago 10, Ill.
Airguide Instrument Co., 2210 Wabansia Ave., Chicago 47, Ill.
Airjet Ventilator Co., 5418 N. Peck Rd., El Monte, Calif.
Airkem, Inc., 241 E. 44 St., New York 17, N. Y.
Airmaster Corp., 4317 Ravenswood Ave., Chicago 13, Ill.
Air-Maze Corp., 25000 Miles Rd., Cleveland 28, O.
Air-Path Products Co., 4620 Doll Ave., Baltimore 15, Md.
Airserco Mfg. Co., Inc., 435 Melwood St., Pittsburgh 13, Pa.
Air-Stream Filter Corp., 2100 Washington Ave., St. Louis 3, Mo.
Airtherm Mfg. Co., 711 S. Spring Ave., St. Louis 10, Mo.
Airtron Corp., Holland, O.
Airwasher Corp., Eaton Rapids, Mich.
Ajax Boiler & Heater Co., 1519 W. 132nd St., Gardena, Calif.
Ajax Corp. of America, 2509 Washington Ave., Evansville, Ind.
Ajax Flexible Coupling Co., Westfield, N. Y.
Ajax Furnace Fitting Co., Div. of Cincinnati Sheet Metal & Roofing Co., 216-220 E. Front St., Cincinnati 2, O.
Akron Metallic Gasket Co., 155 N. Union, P. O. Box 911, Akron 9, O.
Alabama Pipe Co., Anniston, Ala.
Aladdin Heating Corp., 1111 West Ave., 137, San Leandro, Calif.
Albert Pipe Supply Co., Berry & N. 13th, Brooklyn, N. Y.
Albertson & Co., Inc., Sioux City 3, Ia.
Alco Refrigeration Sales & Service, Inc., 3952 St. Clair Ave., Cleveland, O.
Alco Valve Co., 865 Kingsland Ave., St. Louis 5, Mo.
Aldrich Co., 105 E. Williams St., Wyoming, Ill.
Aldrich Pump Co., 4 Pine St., Allentown, Pa.
Alexander Bros., 406 N. 3rd, Philadelphia, Pa.
Allmetal Screw Products Co., Inc., 821 Stewart Ave., Garden City, Long Island, N. Y.
All-State Welding Alloys Co., Inc., White Plains, N. Y.
Allan Engineering Co., P. O. Box 1211, Dallas, Tex.
Allcraft Mfg. Co., 27 Hayward St., Cambridge, Mass.
Allegheny Ludlum Steel Corp., Oliver Bldg., Pittsburgh 22, Pa.
Allegheny Valve Co., 349 Pennsylvania Ave. W., Warren, Pa.
Allen-Bradley Co., 1335 S. First St., Milwaukee 4, Wis.
Allen Co., Inc., L. B., 6702 Bryn Mawr Ave., Chicago 31, Ill.
Allen Co., Robert G., P. O. Box 110, Mechanicsville, N Y.
Allen Cooler & Ventilator, Inc., 704 Woodward, Rochester, Mich.
Allen Mfg. Co., W. D., 566 W. Lake St., Chicago 6, Ill.
Alliance Industries, Huntingden Valley, Pa.
Alliance Mfg. Co., Alliance, O.
Allied Control Co., Inc., 2 East End Ave., New York 21, N. Y.
Allied Weld-Craft, Inc., 401 W. South St., Indianapolis 25, Ind.
Allin Mfg. Co., 1153 W. Grand Ave., Chicago 22, Ill.
Allington & Curtis Mfg. Co., 1800 Holland Ave., Saginaw, Mich.
Allis-Chalmers Mfg. Co., 1171 S. 70th St., Milwaukee 1, Wis.
Allis Co., Louis, The, 427 E. Stewart St., Milwaukee 7, Wis.
Alloy Rods Co., Lincoln Highway West, York, Pa.
Alloy Stainless Products Co., Union Blvd., Totowa, N. J.
Alloy Steel Products Co., 1322 W. Elizabeth Ave., Linden, N. J.
Allpax Co., Inc., Mamaroneck, N. Y.
Alpha Metals, Inc., 56 Water St., Jersey City, N. J.
Alpha Plastics, Inc., 14 Northfield Rd., W. Orange, N. J.
Alphil Spot Welding Co., 1058 Pacific St., Brooklyn, N. Y.
Alrose Chemical Co., Box 1294, Providence 1, R. I.
Alstrom Corp., The, 790 E. 176 St., New York 60, N. Y.
Alton Mfg. Co., 1112 Ross Ave., Dallas 2, Tex.
Aluminum Co. of America, 1501 Alcoa Bldg., Pittsburgh 19, Pa.
Aluminum Wool Div., Carey Electronic Engineering Co., 1880 Clifton Ave., Springfield, O.
Amana Refrigeration, Inc., Amana, Ia.
Amercoat Corp., 4809 Firestone Blvd., South Gate, Calif.
American Agile Corp., Dunham Rd., P. O. Box 168, Bedford, O.
American Air Filter Co., Inc., 373 Central Ave., Louisville 8, Ky.
American Air Filter Co., Inc., Herman Nelson Products, 215 Central Ave., Louisville 8, Ky.
American Blow Pipe Co., 3549 W. Cermak Rd., Chicago 23, Ill.
American Blower Corp., Detroit 32, Mich.
American Brass Co., 414 Meadow St., Waterbury 20, Conn.
American Car & Foundry Co., 30 Church St., New York 8, N. Y.
American Cast Iron Pipe Co., 2930 N. 16th St., Birmingham 2, Ala.
American Chemical Paint Co., Brookside Ave., Ambler, Pa.
American Cladmetals Co., P. O. Box 544, Carnegie, Pa.
American Coal Burner and Wood Stoker Corp., 18 E. Erie St., Chicago 11, Ill.
American Coils Co., 360 Thomas St., Newark 5, N. J.
American Coolair Corp., 3604 Mayflower St., P. O. Box 2300, Jacksonville 3, Fla.
American Cooling Tower Co., 2710 McGee St., Kansas City 8, Mo.
American Cyanamid & Chemical Corp., 30 Rockefeller Plaza, New York, N. Y.
American District Steam Co., Inc., Bryant St., North Tonawanda, N. Y.
American District Telegraph Co., 155 Sixth Ave., New York, N. Y.
American Engineering Co., Aramingo Ave., and Cumberland St., Philadelphia 25, Pa.
American Felt Co., Glenville, Conn.
American Flange & Mfg. Co., Inc., 30 Rockefeller Plaza, New York 20.
American Flexible Coupling Co., 1810 Pittsburgh Ave., Erie, Pa.
American Foundry & Furnace Co., Washington St. at McClun, Bloomington, Ill.
American Furnace Co., 1300 Hampton Ave., St. Louis 10, Mo.

American Gas & Chemicals, Inc., 45 Rockefeller Plaza, New York 20, N. Y.
American Gilsonite Co., 134 W. Broadway, Salt Lake City 1, Utah
American Hair & Felt Co., 1828 Merchandise Mart, Chicago 54, Ill.
American Hard Rubber Co., 93 Worth St., New York 13, N. Y.
American Hydrotherm Corp., 33-70 12th St., Long Island City 6, N. Y.
American Hydrovac, Div. Pitz Foundry Inc., 290 Scholes St., Brooklyn 6, N. Y.
American Instrument Co., Inc., Silver Spring, Md.
American K. A. T. Corp., Garwood, N. J.
American Ladder & Scaffold Co., 5503 N. W. 7th Ave., Miami 38, Fla.
American Locomotive Co., Alco Products Div., Dunkirk, N. Y.
American Locomotive Co., Diesel Engine Div., Schenectady, N. Y.
American Machine Products Co., 401 S. Third Ave., Marshalltown, Ia.
American Machine Wks., Inc., Racine, Wis.
American Manganese Bronze Co., Rhawn & Hegerman Sts., Philadelphia, Pa.
American-Marietta Co., 101 E. Ontario St., Chicago 11, Ill.
American-Marsh Pumps, Inc., 60 Capital Ave., N. E., Battle Creek, Mich.
American Metal Hose Branch, American Brass Co., The, 698 S. Main St., Waterbury 20, Conn.
American Metal Works, Inc., P. O. Box 7027, New Orleans, La.
American Meter Co., Inc., 1513 Race St., Philadelphia 2, Pa.
American Moistening Co., 260 W. Exchange St., Providence, R. I.
American Motors Corp., Nash Kelvinator Corp., 14250 Plymouth Rd., Detroit, Mich.
American Nickeloid Co., 113 Second St., Peru, Ill.
American Photocopy Equipment Co., 1920 W. Peterson Ave., Chicago 26, Ill.
American Pipe Bending Machine Co., Inc., 17 Furnace St., Poultney, Vt.
American Pipe & Steel Corp., 2201 W. Commonwealth Ave., Alhambra, Calif.
American Pipe Tool Co., 4856 W. Kinzie St., Chicago 44, Ill.
American Platinum Wks., 231 New Jersey Railroad Ave., Newark, N. J.
American Potash & Chemical Corp., Aerosol & Refrigeration Div., 3100 E. 26th St., Los Angeles, Calif.
American Pulley Co., The, 4200 Wissahickon Ave., Philadelphia 29.
American Radiator & Standard Sanitary Corp., P.O. Box 1226, Pittsburgh 30, Pa.
American Sand-Banum Co., Inc., 9 Rockefeller Plaza, New York 20.
American Screw Co., Willimantic, Conn.
American Solder & Flux Co., 19th and Willard Sts., Philadelphia, Pa.
American Steel Band Co., P. O. Box 565, Pittsburgh, Pa.
American Steel & Wire Div., United States Steel, Rockefeller Bldg., Cleveland 13, O.
American Thermal Industries, Inc., 440 Illinois, Detroit 1, Mich.
American Tube Products, Inc., Natick, R. I.
American Warming & Ventilating Co., 1017-1021 Summit St., Toledo 4, O.
American Water Softener Co., Lehigh Ave. and 4th St., Philadelphia 33, Pa.
American Wells Wks., 100 N. Broadway, Aurora, Ill.
American Wheelabrator & Equipment Corp., 904 S. Byrkit St., Mishawaka, Ind.
American Zinc Products Div., Ball Brothers Co., Greencastle, Ind.
Ames Iron Works, Inc., Oswego, N. Y.
Aminco Refrigeration Products, American Injector Co., 1000 E. McNichols, Detroit 3, Mich.
Ammco Tools, Inc., North Chicago, Ill.
Ammerman Co., C. L., 104 N. 2nd St., Minneapolis 1, Minn.
Amp Corp., 2921 Locust St., St. Louis, Mo.
Ampco Metal, Inc., Milwaukee 47, Wis.
Ampion Corp., 4-88 47th Ave., Long Island City 1, N. Y.
Analytical Measurements, Inc., 585 Main St., Chatham, N. J.
Anchor Div., Stratton & Terstegge Co., Inc., P. O. Box 311, New Albany, Ind.
Anchor Packing Co., 401 N. Broad St., Philadelphia 8, Pa.
Andale Co., 1740 Cherry St., Philadelphia 3, Pa.
Andersen Corp., Bayport, Minn.
Anderson & Co., Inc., 3100 Lowell St., Sioux City, Iowa
Anderson Co., V. D., The, 1949 W. 96th St., Cleveland 2, O.
Anderson Chemical Co., Inc., 1620 Waterville Rd., Macon, Ga.
Anderson Diesel Engine Co., 6245 State Rd., Philadelphia 35, Pa.
Anderson Products, Inc., 17 Tudor St., Cambridge 39, Mass.
Anderson-Stolz Corp., 1731 Walnut St., Kansas City 8, Mo.
Anemostat Corp. of America, 10 E. 39th St., New York 16, N. Y.
Anesite Co., 3575 Touhy Lincolnwood, Chicago, Ill.
Anetsberger Bros., Inc., Northbrook, Ill.
Annis Air Filter Div., Royal Heaters, Inc., 1024 Westminster Ave., Alhambra, Calif.
Ansul Chemical Co., Refrigeration Div., Marinette, Wis.
Anti-Friction Bearings Co., 2020 S. Figueroa St., Los Angeles 7, Calif.
Applied Mechanics Co., 167 Oliver St., Boston 10, Mass.
April Showers Co., Inc., 4126 Eighth St., N. W., Washington 11, D. C.
Aqua Electric Scale Control, Inc., 2026 E. 22nd St., Cleveland 15, O.
Aqua-Therm, Inc., 748 N. Main, Dayton, O.
Aquatrol Laboratories, Inc., Clifton, N. J.
Arabol Mfg. Co., 110 E. 42nd St., New York 17, N. Y.
Arcee Products, Pawtucket, R. I.
Arco Co., The, 7301 Bessemer Ave., Cleveland 27, O.
Arcos Corp., 1500 S. 50th St., Philadelphia 43, Pa.
Arcweld Mfg. Co., Inc., 3469 Third Ave., W., Seattle 99, Wash.
Ardee Mfg. Co., Inc., 840 N. Seward St, Los Angeles 38, Calif.
Arens Controls, Inc., 2017 Greenleaf St., Evanston, Ill.
Arex Co., 612 N. Michigan Ave., Chicago 11, Ill.
Argo Sales, 436 Capitol Ave., Hartford, Conn.
Arjac Products Inc., 55-59 Halstead St., Rochester 10, N. Y.
Armart Mfg. Co., 103 Hawthorne Ave., Pittsfield, Mass.
Armco Drainage & Metal Products, Inc., Welded Pipe Sales Div., Middletown, O.
Armco Steel Corp., 703 Curtis St., Middletown, Ohio.
Armite Laboratories, 6609 Broad St., Los Angeles 1, Calif.
Armour and Co., Ammonia Div., 1355 W. 31st St., Chicago 9, Ill.
Armstrong Bros. Tool Co., 5200-5300 W. Armstrong Ave., Chicago 30.
Armstrong Co., The, 241 S. Post St., Detroit 17, Mich.
Armstrong Co., Richard M., Westchester, Pa.
Armstrong Cork Co., 4400 Concord St., Lancaster, Pa.
Armstrong Furnace Co., 851 W. 3rd Ave., Columbus, O.
Armstrong Machine Wks., 874 Maple St., Three Rivers, Mich.
Arro Expansion Bolt Co., N. Boone Ave., Marion, O.
Arrow-Hart & Hegeman Elect. Co., 103 Hawthorne St., Hartford 6, Conn.
Arrowhead Rubber Co., 2300 Curry St., Long Beach, Calif.
Art Valve Co., 4662 N. Lincoln Ave., Chicago 25, Ill.
Asbestos Asphalt Insulation Co., 2100 W. Fullerton Ave., Chicago 47.
Ashburn Supply Co., 8468 Warner Dr., Culver City, Calif.
Ashcraft Co., J. P., 5643 Dyer St., Dallas 6, Tex.
Ashton Valve Co., 43 Kendrick St., Wrentham, Mass.
Askania Regulator Co., 240 E. Ontario St., Chicago 11, Ill.
Associated Plastics Co's., Inc., Midland, Mich.
Associated Valve & Engineering Co., 1150 W. Marquette Rd., Chicago Ill.
Aston Products, Inc., 22804 Dequindre, Hazel Park, Mich.
Atkins Saw Div., Borg-Warner Corp., 402 S. Illinois St., Indianapolis 9, Ind.
Atkomatic Valve Co., Inc., 545 W. Abbott St., Indianapolis, Ind.
Atlantic Metal Hose Co., Inc., 308 Dyckman St., New York 34, N. Y.
Atlantic Pipe Bending & Fabricating Corp., Route 17 near Moonachie Ave., P. O. Box 157, Wood-Ridge, N. J.
Atlantic Steel Co., P. O. Box 1714, Atlanta 1, Ga.
Atlantic Steel Boiler Co., S. E. Cor. 22nd & Washington Ave., Philadelphia 46, Pa.
Atlas Chemical Co., Marietta, O.
Atlas Mfg. Co., Eustis at Robbins St., St. Paul 4, Minn.
Atlas Mineral Products Co., Mertztown, Pa.
Atlas Powder Co., Industrial Finishes Dept., North Chicago, Ill.
Atlas Valve Co., 282 South St., Newark, N. J.
Atlas Welding Accessories Co., 707 E. Lewiston Ave., Ferndale 20, Mich.
Auburn Burner Co., Lock Box 269, Auburn, Ind.
Auburn Foundry Inc., Stoker Div., Auburn, Ind.
Auer Register Co., 6600 Clement Ave., Cleveland 5, O.
Aurora Pump Co., 619 Loucks St., Aurora, Ill.
Austin Corp., Robert, 51 Albany St., Boston 11, Mass.
Austin Engineering & Mfg. Co., Inc., 8935 San Jose Rd., Ysleta (El Paso County), Texas
Au-Temp-Co Corp., 657 Broadway, New York 12, N. Y.
Auto-Therm Mfg. Co., 19003 John R., Detroit 3, Mich.
Automatic Burner Corp., 1823 W. Carol, Chicago, Ill.
Automatic Control Co., 995 University Ave., St. Paul 4, Minn.
Automatic Devices Co., Inc., 714 Hillgrove Ave,. Western Springs, Ill.
Automatic Electric Mfg. Co., 10 State St., Mankato, Minn.
Automatic Firing Corp., 4417 Oleatha Ave., St. Louis 16, Mo.
Automatic Gas Equipment Co., 301 Brushton Ave., Pittsburgh 21, Pa.
Automatic Switch Co., 391 Lakeside Ave., Orange, N. J.
Automatic Temperature Control Co., Inc., 5212 Pulaski Ave., Philadelphia 44, Pa.
Autorad Inc., 3535 Fillmore St., Chicago 24, Ill.
Autostributor Co., 226 Leslie St., Lansing 12, Mich.
Avon Tube Div., Higbe Mfg. Co., Ewing Rd., Rochester, Mich.

B

Babbitt Chemical Specialties Co., 36 Prospect St., New Bedford, Mass.
Babbitt Steam Specialty Co., 1 Babbitt Sq., New Bedford, Mass.
Babcock & Wilcox Co., 161 E. 42nd St., New York 17, N. Y.
Babcock & Wilcox Co., Tubular Products Div., Beaver Falls, Pa.
Babcock & Wilcox Co., Tubular Products Div., Keystone Plant, Alliance, O.
Bacharach Industrial Instrument Co., 7301 Penn Ave., Pittsburgh 8.
Bache & Co., Semon, Greenwich & Morton Sts., New York 14, N. Y.
Badger Fire Extinguisher Co., 624 Somerville Ave., Somerville 43, Mass.
Badger Mfg. Co., 230 Bent St., Cambridge 41, Mass.
Badger Sales Co., Inc., 2251 W. Pico Blvd., Los Angeles 6, Calif.
Badham Insulation Co., Inc., 1909 — 1st Ave. S. Birmingham, Ala.
Baer Bros., 438 W. 37th St., New York 18, N. Y.
Bahnson Co., 1001 S. Marshall St., Winston-Salem 1, N. C.
Bailey Co., Chas. M., 667 Folsom St., San Francisco 7, Calif.
Bailey Meter Co., 1050 Ivanhoe Rd., Cleveland 10, O.
Baker Co., Inc., Maplewood, Me.
Baker & Co., Inc., 113 Astor St., Newark 5, N. J.
Bakeraire Corp., 1508 Evans St., South Windham, Me.
Bal-Air, Inc., 1210 McGarock St., Nashville, Tenn.
Balance Engineering Co., 5030 W. Lake St., Chicago 7, Ill.
Baldor Electric Co., 4353 Duncan Ave., St. Louis 10, Mo.
Baldwin Belting, Inc., 74-76 Murray St., New York 7, N .Y.
Baldwin-Hill Co., 596 Breunig Ave., Trenton 2, N. J.
Baldwin-Lima-Hamilton Corp., Philadelphia 42, Pa.
Balloffet Nozzle Co., Inc., 6825 Adams St., Guttenberg, N. J.
Baltimore Aircoil Co., Inc., 2615-2635 Mathews St., Baltimore 18; Md.
Banister Co., Inc., 23 Charles St., Cambridge 41, Mass.
Bar-Brook Mfg. Co., Inc., 6133 Linwood Ave., Shreveport, La.
Barber-Coleman Co., 1228 Rock St., Rockford, Ill.
Barber Gas Burner Co., 3704 Superior Ave., Cleveland 14, O.
Barclay, Inc., Robert, 1236 W. Fulton St., Chicago 7, Ill.
Barco Mfg. Co., 500 Hough St., Barrington, Ill.
Bard Mfg. Co., Bryan, O.
Barkow Mfg. Co., Inc., Aug. G., 2230 South 43rd St., Milwaukee 15.
Barksdale Valves, 5125 Alcoa Ave., Los Angeles 58, Calif.
Barnes Co., A. D., 516 Linden Ave., Dayton 3, O.
Barnes & Jones, Inc., 128 Brookside Ave., Jamaica Plain, Boston 36.
Barnes Manufacturing Co., Mansfield, O.
Barnes Tool Co., The, 152 Brewery St., New Haven 6, Conn.

Barreled Sunlight Paint Co., 43 Dudley St., Providence 1, R. I.
Barrett Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
Barrett Haentjens & Co., Hazleton, Pa.
Barrett Machine Co., 912-916 Behan St., N. S., Pittsburgh 12, Pa.
Barrows Pocelain Enamel Corp., Langdon Farm Rd. & Pa. R. R., Cincinnati, O.
Barry Corp., 765 Pleasant St., Watertown 72, Mass.
Barry Blower Co., 3100 California St., N.E., Minneapolis, Minn.
Bart Mfg. Corp., 227 Main St., Belleville 9, N. J.
Barth Engineering & Mfg. Co., Inc., Milldale, Conn.
Bartlett Mfg. Co., 3003 E. Grand Blvd., Detroit 2, Mich.
Barton Co., 719 Hennepin, Minneapolis, Minn.
Barton Instrument Corp., 1429 S. Eastern Ave., Los Angeles 22, Calif.
Barton Products, Inc., 819 N. Blanchard, Wheaton, Ill.
Barwick Mfg. Corp., 317 E. 18th, Wichita, Kan.
Baseline Mfg. Co., 2701 E. 78th St., Minneapolis 23, Minn.
Basic Refractories, Inc., 845 Hanna Bldg., Cleveland 15, O.
Bastian-Morley Co., Inc., LaPorte, Ind.
Bath Co., Cyril, The, 32400 Aurora Rd., Solon, O.
Bausch & Lomb Optical Co., 633 St. Paul St., Rochester 2, N. Y.
Bayer Co., 4030 Chouteau Ave., St. Louis 10, Mo.
Bayley Blower Co., 1817 S. 66th St., Milwaukee 14, Wis.
Beach Precisions Parts Co., 120 Mechanic St., Boonton, N. J.
Beach-Russ Co., 50 Church St., New York 7, N. Y.
Beacon-Morris Corp., 60 Brainerd Rd., Allston, Boston 34, Mass.
Bear Mfg. Co., Industrial Div., 2030 5th Ave., Rock Island, Ill.
Bearing Co. of America, Federal Mogul Corp., 501 Harrisburg Ave., Lancaster, Pa.
Beaton & Cadwell Mfg. Co., 185 Main St., New Britain, Conn.
Beaton & Corbin Mfg. Co., Southington, Conn.
Beaver Art Metal Corp., Ellwood City, Pa.
Beaver Pipe Tools, Inc., 310 Dana Ave., Warren, O.
Beck Engineering Combustion Kompany, 2100 Cole St., St. Louis 6.
Beckett Corp., R. W., Elyria, O.
Beckett & Co., Inc., Thomas, 2521 Willowbrook Rd., P. O. Box 7354, Dallas 9, Tex.
Beckley Perforating Co., 301 North Ave., Garwood, N. J.
Beckman & Whitley, Inc., 985 San Carlos Ave., San Carlos, Calif.
Belco Industrial Equipment Div., 100 Pennsylvania Ave., Paterson 3, N. J.
Belco Industries, Inc., 3830-32 Olive St., St. Louis 8, Mo.
Belknap Mfg. Co., Div. of Detroit Controls, 800 Union Ave., Bridgeport 1, Conn.
Bell & Gossett Co., 8200 N. Austin Ave., Morton Grove, Ill.
Bellows Co., The, 230 W. Market St., Akron 9, O.
Belmont Packing & Rubber Co., The, Butler & Sepviva Sts., Philadelphia 37, Pa.
Belmont Smelting & Refining Wks., Inc., 349 Belmont Ave., Brooklyn 7, N. Y.
Benjamin Air Rifle Co., 1527 S. 8th St., St. Louis 4, Mo.
Benjamin Electric Mfg. Co., Des Plaines, Ill.
Bennett Oil Co., 964 S. Saddle Creek Rd., Omaha 6, Neb.
Benson Co., Inc., Alex R., 1040 Bay Rd., So., Hudson, N. Y.
Benson, R. C., Pennsauken 8, N. J.
Bergen Pipesupport Corp., 50 Church St., New York 7, N. Y.
Berger Bros. Co., 229-237 Arch St., Philadelphia 6, Pa.
Berger Mfg. Div., Republic Steel Corp., 1038 Belden Ave., Canton 5, O.
Berkeley Pump Co., 829 Bancroft Way, Berkeley, Calif.
Berko Electric Mfg. Co., 212-40 Jamaica Ave., Queens Village 28, N. Y.
Berns Mfg. Corp., 3050 N. Rockwell St., Chicago, Ill.
Bernz Co., Otto, 280 Lyell Ave., Rochester 6, N. Y.
Berry-Hill Corp., Hill Diesel Engine Div., 1 Washington Ave., Providence, R. I.
Bertram Co., Harvey P., The, 561 Reading Rd., Cincinnati 2, O.
Bertsch & Co., Inc., Church St., Cambridge City, Ind.
Besser Metal Products Corp., 754 Clement Ave., Charlotte, N. C.
Best Combustion Equipment Co., Inc., W. N., 415 11th St., Carlstadt, N. J.
Best Register Co., 2005 W. Oklahoma Ave., Milwaukee 15, Wis.
Bete Fog Nozzle Inc., 309 Well St., Greenfield, Mass.
Bethlehem Steel Co., Bethlehem, Pa.
Betz Corp., 445 State St., Hammond, Ind.
Beverly Shear Mfg. Co., 3019 W. 11th St., Chicago 43, Ill.
Bica Co., 1170 N. State St., Girard, O.
Biersach & Niedermeyer Co., 1937 N. Hubbard St., Milwaukee 12.
Bigelow Co., The, 174 River St., New Haven 3, Conn.
Bigelow Liptak Corp., 2550 W. Grand Blvd., Detroit 8, Mich.
Biggs Boiler Wks. Co., The, 1007 Bank St., E. Akron 5, O.
Bignall & Keeler Div., John Ramming Machine Co., 4591 McRee Ave., St. Louis 10, Mo.
Billings & Spencer Co., 1 Laurel St., Hartford 1, Conn.
Binks Mfg. Co., 3114-40 Carroll Ave., Chicago 12, Ill.
Birchfield Boiler, Inc., 2503 E. 11th St., Tacoma 1, Wash.
Bird-Archer Co., 4337 North American St., Philadelphia 40, Pa.
Birdsell Mfg. Co., Inc., 750 San Antonio Rd., Palo Alto, Calif.
Birks Mfg. Co., 811 Hanover Rd., Meriden, Conn.
Bishop & Babcock Mfg. Co., 4901 Hamilton Ave., Cleveland 14, O.
Bituminous Coal Institute, Southern Bldg., Washington 5, D. C.
Black & Decker Mfg. Co., 628 Pennsylvania Ave., Towson 4, Md.
Black Magic Products Co., P. O. Box 1703, Tulsa, Okla.
Black Mfg. Co., The, 201 Second St., Harrison, N. J.
Black-Sivalls & Bryson, Inc., 7500 E. 12th St., Kansas City 26, Mo.
Black & White Chemical Co., 130 Walnut Ave., New York 54, N. Y.
Blackhawk Mfg. Co., 5325 W. Rogers St., Milwaukee 1, Wis.
Blackmer Pump Co., 1920A Century Ave., S. W., Grand Rapids 9.
Blaisdell Compressor Co., 227 Fulton St., New York, N. Y.
Blaw Knox Co., Power Piping and Sprinkler Div., 829 Beaver Ave., Pittsburgh 33, Pa.
Blazer, M., & Son, 173 Market St., Passaic, N. J.
Blissfield Mfg. Co., Blissfield, Mich.
Blokolgas System, Inc., 70 W. Alexandrine, Detroit 1, Mich.
Blood Brothers Machine Div., Rockwell Spring and Axle Co., Allegan, Mich.
Blossom Mfg. Co., Inc., 915 Broadway, New York 10, N. Y.
Blower Application Co., 3165 N. 30th St., Milwaukee 16, Wis.
Blue Ridge Talc Co., Inc., Henry, Va.
Blue Seal Chemical Co., 177 Westfield Ave., W., Roselle Park, N. J.
Bock Corp., 110 S. Dickinson St., Madison, Wis.
Bodine Electric Co., 2254 W. Ohio St., Chicago 12, Ill.
Boiler Engineering & Supply Co., Manavon Rd., Phoenixville, Pa.
Bolta Products, A Div. of General Tire & Rubber Co., Lawrence, Mass.
Bonafide Genasco, Inc., 295 Fifth Ave., New York 16, N. Y.
Bonair Products, Inc., 5th & Ellis Sts., Colwyn, Pa.
Bonney Forge & Tool Wks., 715 Meadow St., Allentown, Pa.
Bordo Co., Inc., L. J., 115 New St., Glenside, Pa.
Borg-Warner Corp., Hydraline Products Div., 18538 Mack Ave., Detroit 36, Mich.
Borm Mfg. Co., 23 N. Union St., Elgin, Ill.
Boston Auto Gage Co., 70 West St., Pittsfield, Mass.
Boston Gear Works, Quincy 71, Mass.
Boston Machine Works Co., 7 Willow St., Lynn, Mass.
Boston Woven Hose & Rubber Co., 29 Hampshire St., Cambridge.
Botfield Refractories Co., Swanson & Clymer Sts., Philadelphia 47, Pa.
Bound Brook Oil-less Bearing Co., Bound Brook, N. J.
Bowen Engineering, Inc., North Branch, N. J.
Bowerston Shale Co., The, P.O. Box 2, Bowerston, O.
Bowman Co., D. F., 315 W. Main St., New Albany, Ind.
Bowser, Inc., 1302 E. Creighton Ave., Fort Wayne 2, Ind.
Boylston Steam Specialty Co., 116-122 W. Illinois St., Chicago, Ill.
Brabender Corp., Rochelle Park, N. J.
Brady Co., W. H., 727 W. Glendale Ave., Milwaukee 12, Wis.
Breidert Co., G. C., P. O. Box 1190, San Fernando, Calif.
Bremil Mfg. Co., 1020 Holland St., Erie, Pa.
Bressler Engineering Service, Oregon, Ill.
Bridgeport Brass Co., 30 Grand St., Bridgeport 2, Conn.
Bridgeport Thermostat Div., Robertshaw-Fulton Controls Co., Connecticut Ave., Bridgeport 1, Conn.
Brighton-Dickinson Div., 3174 S. Archer, Chicago 8, Ill.
Bristol Co., The, P. O. Box 1790, Waterbury 20, Conn.
Broan Mfg. Co., Inc., 1669 N. Water St., Milwaukee 2, Wis.
Brockway Co., 361 Church St., Naugatuck, Conn.
Bronson Fan Mfg. Corp., 4758 Worth St., Los Angeles, Calif.
Bronze Bearings, Inc., 340 North Ave., E. Cranford, N. J.
Brook Motor Corp., 3555 W. Peterson Ave., Chicago 45, Ill.
Brooke Engineering Co., Inc., 4517 Wayne Ave., Philadelphia 44, Pa.
Brookfield Engineering Laboratories, Inc., 2 Porter St., Stoughton, Mass.
Brooklyn Varnish Mfg. Co., 50 Jay St., Brooklyn 1, N. Y.
Brooks Equipment Corp., 217 Hudson St., Hoboken, N. J.
Brooks Rotameter Co., Lansdale, Pa.
Brookside Products Co., Inc., McCordsville, Ind.
Bros Boiler & Mfg. Co., Wm., 1057 10th Ave., S. E., Minneapolis 14.
Brown Co., 150 Causeway St., Boston, Mass.
Brown-Brockmeyer Co., Inc., P. O. Box 989, Dayton 1, O.
Brown-Electro Co., 17 N. Dewey, Oklahoma City 2, Okla.
Brown Fintube Co., The, Elyria, O.
Brown Products Co., 97-12 Metropolitan Ave., Forest Hills, N. Y.
Browning Mfg. Co., Inc., 1940 Browning Blvd., Maysville, Ky.
Brundage Co., The, 503 N. Park St., Kalamazoo 11, Mich.
Bruner Corp., 2318 N. 30th St., Milwaukee, Wis.
Bruning Co., Inc., Charles, 4700 Montrose Ave., Chicago 41, Ill.
Brunner Co., The, Rt. 129, Athens Rd., Gainesville, Ga.
Brunner Mfg. Co., 1821 Broad St., Utica 1, N. Y.
Bryan Steam Corp., P. O. Box 337, Peru, Ind.
Bryant Heater Div., Affiliated Gas Equipment Co., Inc., 17825 St. Clair Ave., Cleveland 10, O.
Bubar, Dust Systems, Inc., Old Lyme, Conn.
Buckeye Furnace Pipe Co., Columbus 8, O.
Buckeye Tools Corp., 5005 Springboro Pike, Dayton 9, O.
Buda Co., Harvey, Ill.
Buell Engineering Co., 70 Pine St., New York 5, N. Y.
Buensod-Stacey, Inc., 60 E. 42nd St., New York 17, N. Y.
Buffalo Bolt Co., Div. of Buffalo-Eclipse Corp., North Tonawanda, N. Y.
Buffalo Forge Co., 171 Mortimer St., Buffalo 5, N. Y.
Buffalo Meter Co., 2917 Main St., Buffalo 14, N. Y.
Buffalo Pumps, Inc., 171 Mortimer St., Buffalo 5, N .Y.
Buffalo Tank Corp., South Ave., Dunellen, N. J.
Buflovak Equipment Div. of Blaw-Knox Co., 50 Winchester Ave., Buffalo 11, N. Y.
Builders-Providence, Inc., Div. of B-I-F Industries, Inc., 381 Harris Ave., Providence 1, R. I.
Bullard Co., The, Bridgeport 2, Conn.
Bump Pump Co., La Crosse, Wis.
Bundy Tubing Co., 8109 E. Jefferson Ave., Detroit 14, Mich.
Burden Co., Alan E., 3352 Motor Ave., Los Angeles 34, Calif.
Burdett Mfg. Co., 3433 W. Madison St., Chicago 24, Ill.
Burdett Oxygen Co. of Calif., 2014 Belgrave Ave., Huntington Park, Calif.
Burgess-Manning Co., Architectural Products Div., 5970 Northwest Highway, Chicago 31, Ill.
Burke Electric Co., Div. of Marathon Electric Mfg. Corp., 1201 W. 12th St., Erie, Pa.
Burling Instrument Co., Air Conditioning Div., 16 River Rd., Chatham, N. J.
Burnham Corp., Main St., Irvington, N. Y.
Burnley Battery & Mfg. Co., 103 Clay St., North East, Pa.
Burrows Mfg. Co., F. A., 318 E. Poplar St., York, Pa.
Burt Mfg. Co., 41 E. South St., Akron 11, O.
Bury Compressor Co., 18th & Cascade Sts., Erie, Pa.
Bush Mfg. Co., 179 South St., West Hartford 10, Conn.
Butler, Inc., H. F., P. O. Box 121 — 55, Union, N. J.
Byers Co., A. M., Clark Bldg., Pittsburgh 22, Pa.
Byron Jackson Co., P. O. Box 2017, Terminal Annex, Los Angeles 54.

C

C C Pump Mfg. Div., Market-Madison Sts., Palmyra, N. J.
CCA Products, Inc., P. O. Box 671, Glendale 5, Calif.
C & H Air Conditioning Fan Co., Inc., 1603 DeKalb Ave., N. E., Atlanta 6, Ga.
Cabot, Inc., Samuel, 141 Milk St., Boston 9, Mass.
Calbar Paint & Varnish Co., 2612-26 N. Martha St., Philadelphia 25.
Calculator Specialties Co., 122 S. Michigan Ave., Chicago 3, Ill.
Caldwell Co., W. E., 2120 Brook St., Louisville, Ky.
Calgon, Inc., Hagan Bldg., Pittsburgh 30, Pa.
California Brass Mfg. Co., 1447 Naud St., Los Angeles 12, Calif.
Callahan Can Machine Co., Inc., 80 Richard St., Brooklyn, N. Y.
Cambridge Filter Corp., 738 Erie E. Blvd., Syracuse 3, N. Y.
Camco Products Inc., 445 State St., North Haven, Conn.
Cameron Iron Works, Inc., P. O. Box 1212, Houston, Tex.
Camloc Fastener Corp., 22 Spring Valley Rd., Paramus, N. J.
Campbell Co., E. K., Manchester at 18th, Kansas City 26, Mo.
Campbell Co., J. A., 645 E. Wardlaw Rd., Long Beach 7, Calif.
Campbell Heating Co., 3121 Dean Ave., Des Moines 17, Ia.
Cam-Stat, Inc., Div. of The Paul Henry Co., 11833 West Olympic Blvd., Los Angeles 64, Calif.
Cannon Chemical Co., Inc., 181 Portland St., Cambridge 41, Mass.
Canton Stoker Corp., 2400 Andrew Place, S. W., Canton 1, O.
Canvas Products Co., 2115 Locust St., St. Louis 3, Mo.
Capewell Mfg. Co., 60 Governor St., Hartford 2, Conn.
Capitol Machine Works, 424 7th St., Oakland, Calif.
Capitol Mfg. & Supply Co., 153 W. Fulton St., Columbus, O.
Carbide and Carbon Chemicals Co., A Div. of Union Carbide and Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Carboline Co., The, 331 Thornton Ave., St. Louis 19, Mo.
Carboloy Dept. of General Electric Co., 11177 E. 8 Mile Rd., Detroit.
Cardox Corp., 307 N. Michigan Ave., Chicago, Ill.
Carey Electronic Engineering Co., Metal Wool Div., 1880 Clifton Ave., Springfield, O.
Carey Mfg. Co., Philip, Wayne Ave., Lockland, Cincinnati 15, O.
Cargocaire Engineering Corp., 15 Park Row, New York 38, N. Y.
Carlin Co., The, Wethersfield, Conn.
Carling Turbine Blower Co., 25 St. John's Rd., Worcester 3, Mass.
Carlon Products Corp., 10225 Meech Ave., Cleveland 5, O.
Carlson & Sullivan, 1617 California St., Monrovia, Calif.
Carnes, Inc., John R., Greenlawn Ave. & Erie R. R., Lima, O.
Carnes Corp., Verona, Wis.
Carney Co., Inc., The, Mankato, Minn.
Carolina Aniline & Extract Co., 301 S. Cedar St., Charlotte, N. C.
Carolina Blower Co., Inc., 430 Morehead Ave., Greensboro, N. C.
Carpenter Heating & Stoker Co., 2135 St. Clair Ave., Cleveland 14, O.
Carpenter Valve Corp., The, 6723 Denison Ave., Cleveland 2, O.
Carpenter & Paterson, Inc., 18 Hurley St., Cambridge 41, Mass.
Carpenter Steel Co., Alloy Tube Div., Union, N. J.
Carrier Corp., 300 S. Geddes St., Syracuse 1, N. Y.
Carty & Moore Engineering Co., 1150 W. Baltimore Ave., Detroit 2, Mich.
Carvell Heat Equipment Co., 1217 Temple St., Los Angeles 26, Calif.
Carver Pump Co., 1460 Hershey Ave., Muscatine, Ia.
Case & Son Mfg. Co., W. A., 33 Main St., Buffalo 3, N. Y.
Cash Co., A. W., P. O. Box 551, Decatur, Ill.
Cash Valve Mfg. Corp., A. W., 6621 E. Wabash Ave., Decatur, Ill.
Cashin Co., W. D., 69 A. St., Boston 27, Mass.
Catawissa Valve & Fittings Co., Catawissa, Pa.
Catskill Metal Works, Inc., Catskill, N. Y.
Cauhorn Distributing Co., 9999 Broadstreet, Detroit 4, Mich.
Celco Corp., 110 E. 42nd St., New York 17, N. Y.
Celotex Corp., The, 120 S. La Salle St., Chicago 3, Ill.
Cement Lined Pipe Co., 93 Brookline St., Lynn, Mass.
Central Brass Mfg. Co., 2950 E. 55th St., Cleveland 27, O.
Central Die Casting & Mfg. Co., Inc., 2935 W. 47th St., Chicago, Ill.
Central Foundry Co., Murray & Pacific Sts., Newark 5, N. J.
Central Rubber & Steel Corp., P. O .Box 420, Findlay, O.
Central States Mfg. Co., Inc., 1200-12 Summit St., Arkansas City, Kan.
Central States Steel Boiler Co., 4649 W. Harrison St., Chicago 44, Ill.
Central Station Steam Co., 2920 E. Woodridge St., Detroit 7, Mich.
Central Steel & Wire Co., 3000 W. 51st St., Chicago 80, Ill.
Central Wire & Iron Works, 621 E. Locust St., Des Moines, Ia.
Centrifix Corp., 3608 Payne Ave., Cleveland 14, O.
Centri-Spray Corp., 39001 Schoolcraft Rd., Livonia, Mich.
Century Electric Co., 1806 Pine St., St. Louis 3, Mo.
Century Engineering Corp., 401-431 3rd St., S. E., Cedar Rapids, Ia.
Century Fan & Ventilator Co., 41 Cedar St., Stamford, Conn.
Century Instrument Co., 565 East Milwaukee St., Detroit, Mich.
Certain-teed Products Corp., 120 E. Lancaster Ave., Ardmore, Pa.
Certified Flexible Couplings, 341 East 233rd St., New York 70, N. Y.
Chace Co., W. M., 1606 Beard Ave., Detroit 9, Mich.
Chain Belt Co., 4617 W. Greenfield, Milwaukee 1, Wis.
Chamberlin Co. of America, 1254 La Brosse St., Detroit 32, Mich.
Champion Blower & Forge Co., Harrisburg Ave., and Charlotte St., Lancaster, Pa.
Champion Furnace Pipe Co., 215 Eaton St., Peoria 3, Ill.
Champion Laboratories, Inc., Meriden, Conn.
Champion Machine & Forging Co., 3695 E. 78th St., Cleveland 5, O.
Chaplin-Fulton Mfg. Co., 5800 Grand Ave., Pittsburgh 25, Pa.
Chapman Valve Mfg. Co., The, Indian Orchard, Mass.
Char-Gale Mfg. Co., 4325 Hiawatha Ave., Minneapolis 6, Minn.
Chase Brass & Copper Co., 236 Grand St., Waterbury 20, Conn.
Chase-Shawmut Co., Newburyport, Mass.
Chelsea Fan & Blower Co., Inc., 639 South Ave., Plainfield, N. J.
Chelsea Metal Stamping Co., 95 8th Ave., New York 11, N. Y.
Chemalloy Associates, Santee, Calif.
Chemical Engineering Co., 2800 Logan St., P. O. Box 1076, Dallas 1.
Chemical & Metallurgical Products, Inc., 74 Washington St., New York, N. Y.
Chemical Solvent Co., 3005 N. 16th St., Birmingham, Ala.
Chempump Corp., 1300 E. Mermaid Lane, Philadelphia 18, Pa.
Chemurgic Process Corp., 55 West 42nd St., New York, N. Y.
Cheney Flashing Co., 623 Prospect St., Trenton 5, N. J.
Chesflex Corp., Yonkers, N. Y.
Chester Cable Corp., Chester, N. Y.
Chesterton Co., A. W., 6 Ashland St., Everett 49, Mass.
Chicago Belting Co., 113-125 N. Green St., Chicago 7, Ill.
Chicago Blower Corp., 9867 Pacific Ave., Franklin Park, Ill.
Chicago Bridge & Iron Co., 332 S. Michigan Ave., Chicago 4, Ill.
Chicago Die Casting Mfg. Co., 2510-14 W. Monroe St., Chicago 12, Ill.
Chicago Expansion Bolt Co., 1338 W. Concord Pl., Chicago 22, Ill.
Chicago Fire Brick Co., 1467 N. Elston Ave., Chicago 22, Ill.
Chicago Float Works, Not Inc., Dept. T., 2330 S. Western Ave., Chicago 8, Ill.
Chicago Forging and Mfg. Co., 2000 Southport Ave., Chicago 14, Ill.
Chicago Furnace Supply Co., 1278 Clybourn Ave., Chicago, Ill.
Chicago Gasket Co., 1275 West North Ave., Chicago 22, Ill.
Chicago Metal Mfg. Co., 3724 S. Rockwell St., Chicago 32, Ill.
Chicago Nipple Mfg. Co., 1616 S. Laramie Ave., Cicero 50, Ill.
Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y.
Chicago Pump Co., 622 Diversey Pkwy., Chicago 14, Ill.
Chicago Specialty Mfg. Co., 2954 Lawrence Ave., Chicago 25, Ill.
Chicago Steel Furnace Co., 9326 S. Anthony Ave., Chicago 17, Ill.
Chicago Steel Tank Co., 6400 W. 66th, Chicago 38, Ill.
Chicago-Wilcox Mfg. Co., 7701 Avalon Ave., Chicago, Ill.
Chiksan Co., Brea, Calif.
Childers Mfg. Co., 3620 W. 11th St., Houston 8, Tex.
Chisholm-Moore Hoist Div., Columbus McKinnon Chain Corp., Tonawanda, N. Y.
Chrysler Airtemp, Div. of Chrysler Corp., 1600 Webster St., Dayton 1, O.
Churchward Welding Accessories, Jack, North Haven, Conn.
Cincinnati Electrical Tool Co., The, 2684 Madison Rd., Cincinnati 8, O.
Cincinnati Metalcrafts Inc., 5000 Brotherton Rd., Cincinnati 9, O.
Cincinnati Shaper Co., Hopple, Garrard and Elam, Cincinnati 25, O.
Cincinnati Sub-Zero Products Co., 3928 Reading Rd., Cincinnati 29, O.
Cinder Products Corp., 75 Ellenfield St., Providence, R. I.
Cissell Mfg. Co., W. M., 831 First St., P. O. Box 1143, Louisville 1, Ky.
Clarage Fan Co, Porter St., Kalamazoo 16, Mich.
Clark Bros. Co., Inc., Div. of Dresser Industries, 600 Lincoln St., Orlean, N. Y.
Clark Bros. Bolt Co., Milldale, Conn.
Clark Bros. Mfg. Co., Hillsboro, Ore.
Clark Controller Co., 1146 E. 152nd St., Cleveland 10, O.
Clark Dust Control Co., 210 N. Mozart St., Chicago, Ill.
Clark Electric Co., Jas., Jr., 615 Bergman St., Louisville 3, Ky.
Clark Mfg. Co., 1830 E. 38th St., Cleveland 14, O.
Claronex Products, Inc., 239 Java St., Brooklyn 22, N. Y.
Cla-Val Co., P. O. Box 949, Alhambra, Calif.
Clay Equipment Corp., Cedar Falls, Ia.
Claymont Steel Corp., Div. of Colorado Fuel & Iron Corp., Claymont, Del.
Clayton Mfg. Co., 401 N. Temple City, El Monte, Calif.
Clayton & Lambert Mfg. Co., 1701 Dixie Hwy., Louisville 10, Ky.
Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis.
Cleveland Brass Mfg. Co., The, 4606 Hamilton Ave., Cleveland, O.
Cleveland Crane & Eng. Co., 5866 E. 289th St., Wickliffe, O.
Cleveland Fuel Equipment Co., 1111 Brookpark Rd., Cleveland 9, O.
Cleveland Graphite Bronze Co., 17000 St. Clair Ave., Cleveland 10, O.
Cleveland Heater Co., 2310 Superior Ave., Cleveland 14, O.
Cleveland Humidifier Co., 7802 Wade Park Ave., Cleveland 3, O.
Cleveland Punch & Shear Works Co., E. 40th and St. Clair Ave., Cleveland 14, O.
Cleveland Worm & Gear Co., 3249 E. 80th St., Cleveland 4, O.
Clifford Mfg. Co., Div. of Standard-Thompson Corp., 152 Grove St., Waltham 54, Mass.
Climatemaker Heat Loss Calculator Co., Box 378, Bloomington, Ill.
Climax Machinery Co., 301 S. La Salle St., Indianapolis, Ind.
Climax Metal Products Co., 863 E. 140 St., Cleveland 10, O.
Clime-Matic Corp., Connecticut & Richards Ave., South Norwalk, Conn.
Clinton Metallic Paint Co., P. O. Box 278, Clinton, N. Y.
Clipper Mfg. Co., 65 E. 28th St., Kansas City 8, Mo.
Clizbe Bros. Mfg. Co., Plymouth, Ind.
Clow & Sons, James B., 201-299 N. Talman Ave., Chicago 12, Ill.
Cobra Pipe & Coil Co., Inc., Brook St., P. O. Box 176, Elmwood 10, Conn.
Cochrane Corp., 3131 N. 17th St., Philadelphia 32, Pa.
Coe Mfg. Co., Bank St., Painesville, O.
Coen Co., 40 Boardman Pl., San Francisco 3, Calif.
Coffin Co., J. S., Jr., 326 S. Dean St., Englewood, N. J.
Coffing Hoist Co., Danville, Ill.
Coolerator Co., New Garrick Bldg., Duluth. Minn.
Cole-Sewell Engineering Co., 2288 University Ave., St. Paul 4, Minn.
Coleman-Petterson Corp., 2130 St. Clair Ave., Cleveland 14, O.
Colonial Alloys Co., Metals Div., Ridge Ave. and Crawford St., Philadelphia 29, Pa.
Columbia Acoustics & Fireproofiing Co., Stanhope, N. J.
Columbia Boiler Co., Pottstown, Pa.
Columbia Engineering Service Co., 4025 Sebastopol Hiway, Santa Rosa, Calif.
Columbia-Geneva Steel Div., United States Steel Corp., Russ Bldg., 235 Montgomery St., San Francisco 6, Calif.
Columbian Steel Tank Co., 1509 W. 12th St., Kansas City 7, Mo.
Columbus Heating & Ventilating Co., 182 N. Yale Ave., Columbus 16, O.
Columbus Steam Pump Wks. Co., 724 W. Gay St., Columbus 8, O.
Combustion Control Div., Electronics Corp. of America, 718 Beacon St., Boston 15, Mass.
Combustion Engineering Inc., 200 Madison Ave., New York 16, N. Y.
Combustion Equipment Co., Box 734 B, Silvis, Ill.
Comfort Products Corp., 2220 Lamesa, Dallas 2, Tex.

Commercial Filters Corp., 2 Main St., Melrose 76, Mass.
Commercial Plastics Co., 2812 W. North Ave., Chicago 47, Ill.
Commercial Shearing & Stamping Co., 1775 Logan, P. O. Box 719, Youngstown 1, O.
Commercialaire, Inc., 300 Pacific St., Brooklyn 2, N. Y.
Committee on Steel Pipe Research, American Iron and Steel Institute, 350 Fifth Ave., New York 1, N. Y.
Commonwealth Brass Corp., 5781-5835 Commonwealth Ave., Detroit 8, Mich.
Conco Engineering Works, Div. of H. D. Conkey & Co., Mendota, Ill.
Condensation Engineering Corp., 3511 W. Potomac Ave., Chicago 31, Ill.
Condenser Service & Engineering Co., Inc., 150 Observer Highway, Hoboken, N. J.
Conditionaire Unit Co., 2821 Montrose Ave., Chicago 18, Ill.
Congress Drives Div., Tann Corp., 3750 E. Outer Drive, Detroit 34, Mich.
Congress Fan & Electric Co., P. O. Box 3747, Peninsula Sta., Daytona Beach, Fla.
Conneaut Plastic Metallic Packing Co., Conneaut, O.
Connery Construction Co., 2nd and Luzerne Sts., Philadelphia 40, Pa.
Connor Engineering Corp., Danbury, Conn.
Conoflow Corp., Dept. P, 2100 Arch St., Philadelphia 3, Pa.
Consolidated Boiler Corp., 126 Dartmouth St., Boston 16, Mass.
Consolidated Metal Products Corp., Albany, N. Y.
Continental Air Filters, Inc., Box 1647, Louisville 1, Ky.
Continental Can Co., Millsplastic Pipe Div., 100 E. 42nd St., New York 17, N. Y.
Continental-Diamond Fibre Co., Newark, Del.
Continental Electric Co., Inc., 323 Ferry St., Newark, N. J.
Continental Machine Co., 1952-54 Maud Ave., Chicago 14, Ill.
Continental Motors Corp., Muskegon 82, Mich.
Continental Products Co., 1150 E. 222nd St., Euclid 17, O.
Continental Radiant Glass Heating Corp., 1 E. 35th St., New York 16.
Continental Rubber Wks., 2000 Liberty St., Erie, Pa.
Continental Screw Co., Mt. Pleasant St., New Bedford, Mass.
Continental Steel Corp., 1108 S. Main St., Kokomo, Ind.
Contour Marker Corp., 1843½ E. Compton Blvd., Compton 2, Calif.
Controlair Mfg. Co., 1932 S. Compton Ave., Los Angeles, Calif.
Control Engineering Corp., Controls Div., 934 Washington St., Norwood, Mass.
Cook Co., Loren, 664 Front St., Berea, O.
Cook Electric Co., 2700 Southport Ave., Chicago 14, Ill.
Cool-Ette, Inc., 20080 James Couzens Hwy., Detroit 35, Mich.
Cooper Alloy Corp., Bloy St. & Ramsey Ave., Hillside, N. J.
Cooper-Bessemer Corp., The, Mt. Vernon, O.
Cooper Co., Clark, Palmyra, N. J.
Cooper Hewitt Electric Co., 72-732 Grand St., Hoboken, N. J.
Copeland Refrigeration Corp., Sidney, O.
Copes-Vulcan Div., Continental Foundry & Machine Co., 939 West 26th St., Erie 4, Pa.
Coppus Engineering Corp., 344 Park Ave., Worcester 2, Mass.
Coral Designs, Div. of Henry G. Dietz Co., 12-16 Astoria Blvd., Long Island City 2, N. Y.
Corbman Bros., Inc., 25th & York St., Philadelphia, Pa.
Cordo Chemical Co., 34 Smith St., Norwalk, Conn.
Cork Insulation Co., Inc., 730-5th Ave., New York, N. Y.
Corley Co., Inc., The, One Exchange Place, Jersey City 2, N. J.
Corning Glass Works, Corning, N. Y.
Cornish-Rutland Co., Rutland, Vt.
Coroaire Heater Corp., The, 1124 Hanna Bldg., Cleveland 15, O.
Corrosite Div., Reliance Paint Co., 64 So. 6th St., Brooklyn, N. Y.
C-O Two Fire Equipment Co., Newark, N. J.
Coughlan Co., G. N., West Orange, N. J.
Couplings Co., 2205 W. Roosevelt Rd., Chicago 8, Ill.
Cox Mfg. Co., Ridgeville, Ind.
Cramer Co., R. W., Centerbrook, Conn.
Crane Co., 836 S. Michigan Ave., Chicago 5, Ill.
Crane Packing Co., 1872 Cuyler Ave., Chicago 13, Ill.
CraneVeyor Corp., 1240 S. Boyle Ave., Los Angeles 23, Calif.
Crawford Co., 3220 W. 31st St., Chicago 23, Ill.
Crawford Fitting Co., 884 East 140th St., Cleveland 10, O.
Crescent Plastics, Inc., 955 Diamond Ave., Evansville, Ind.
Crescent Tool Co., 230 Harrison St., Jamestown, N. Y.
Croll-Reynolds Engineering Co., Inc., 17 John St., New York 38, N. Y.
Croll & Son, Jesse G., 2326-2606 Germantown Ave., Philadelphia, Pa.
Crosby Steam Gage & Valve Co., 43 Kendrick St., Wrentham, Mass.
Crosley Div., Avco Mfg. Corp., Cincinnati, O.
Crotty Mfg. Corp., 133-15 35th Ave., Flushing, L. I., N. Y.
Crowell & Dunn, Inc., 225 Lafayette St., New York, N. Y.
Crown Controls Co., Inc., 124 S. Washington St., New Bremen, O.
Crown Die & Tool Corp., 108 N. Jefferson St., Chicago 6, Ill.
Crown Engineer Corp., Locust St., Keyport, N. J.
Crown Iron Works Co., 1202 N. E. Tyler, Minneapolis, Minn.
Crucible Steel Co. of America, Oliver Bldg., P. O. Box 88, Pittsburgh 30, Pa.
Cryer Trap & Valve Div., Encor Corp., 28 Joralemon St., Belleville, N. J.
Culligan Inc., Northbrook, Ill.
Cuno Engineering Corp., 78 S. Vine St., Meriden, Conn.
Curtis Refrigerating Machine Div., Curtis Mfg. Co., 1950 Kienlen Ave., St. Louis 20, Mo.
Custom Engineering Co., 406 S. Main St., Los Angeles 13, Calif.
Custom Mfg. Co., 4105 W. Fullerton Ave., Chicago 39, Ill.
Cutler-Hammer, Inc., 421 N. 12th St., Milwaukee 1, Wis.
Cybertronic Corp. of America, Third & Morton Aves., Chester, Pa.
Cyclotherm Div., United States Radiator Corp., 157 E. First St., Oswego, N. Y.

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DK Mfg. Co., Cobra Metal Hose Div., 4640 W. 54th St., Chicago, Ill.
Daffin Mfg. Co., Lancaster, Pa.
Dahl, G. W., 430 High St., Bristol, R. I.
Dahlquist Mfg. Co., Inc., Div. of Process Engineering Inc., 628 Somerville Ave., Somerville 43, Mass.
Daigger & Co., A., 161 W. Kinzie St., Chicago, Ill.
Dalmo-Victor Co., San Carlos, Calif.
Daly, Merritt & Sullivan, Inc., West Broad St., Falls Church, Va.
Dalzen Mfg. Co., 525 South Riverside, St. Clair, Mich.
Dampney Co., The, 1243 River St., Hyde Park, Boston 36, Mass.
Dana Fan & Blower Corp., 3501-27 Colerain Ave., Cincinnati 23, O.
Danzer Metal Works Co., Box 201, Hagerstown, Md.
Darcoid Co., Inc., 145 Sixth Ave., New York 13, N. Y.
Darling Valve & Mfg. Co., 701 First St., Williamsport, Pa.
Dart Union Co., 134 Thurbers Ave., Providence 5, R. I.
Das Div. of The Zeller Corp., Fort Wayne Rd., Defiance, O.
Davey Compressor Co., Kent, O.
Davidson Co., M. T., 7 Dey St., New York 7, N. Y.
Davidson Hyduty Roof Fan Co., 213 California St., Newton, Mass.
Davies & Co., Wayne, Westboro, Mass.
Davis Engineering Corp., 1070 E. Grand St., Elizabeth 4, N. J.
Davis Instruments, Div. of Davis Emergency Equipment Co., Inc., 201 Halleck St., Newark 4, N. J.
Davis Regulator Co., 2546 S. Washtenaw Ave., Chicago 8, Ill.
Davison Chemical Co., Div. of W. R. Grace & Co., 101 N. Charles St., Baltimore 3, Md.
Day & Night Div., Affiliated Gas Equipment, Inc., 700 Royal Oaks Dr., Monrovia, Calif.
Day Co., The, 810-830 Third Ave., N. E., Minneapolis 13, Minn.
Dayton Air Compressor Co., The, 427 Valley St., Dayton 4, O.
Dayton Electric Mfg. Co., 126 S. Oakley Blvd., Chicago 12, Ill.
Dayton Pump & Mfg. Co., 500 N. Webster St., Dayton 1, O.
Dayton Rubber Co., 2342 W. Riverview Ave., Dayton 1, O.
Daytronic Corp., 216 S. Main St., Dayton 2, O.
Dean Brothers Pumps, Inc., 323 W. 10th St., Indianapolis 7, Ind.
Dean Hill Pump Co., 4000 E. 16th St., Indianapolis 7, Ind.
Dearborn Chemical Co., Merchandise Mart Plaza, Chicago 54, Ill.
Dearborn Stove Co., 1700 W. Commerce St., P. O. Box 5527, Dallas 2, Tex.
Debevoise Co., The, 74-84 20th St., Brooklyn 32, N. Y.
DeBothezat Fans Div., American Machine & Metals, Inc., East Moline, Ill.
Decatur Iron & Steel Co., P. O. Box 72, Decatur, Ala.
Decatur Pump Co., 2750 Nelson Park Rd., Decatur, Ill.
Deering Air Conditioning Co., The, 1069 Celestial St., Cincinnati 2, Ohio.
Defender Instrument & Regulator Co., 815 Clark Ave., St. Louis 4, Mo.
De Laval Steam Turbine Co., Trenton 2, N. J.
Delavan Mfg. Co., 811 Fourth Ave., West Des Moines, Ia.
Delco Appliance Div., General Motors Corp., P. O. Box 230, Rochester 1, N. Y.
Delco Products Div., General Motors Corp., 329 E. First St., Dayton 1, O.
Delta Heating Corp., Cole St. & Reading R. R., Trenton 8, N. J.
Deming Co., 14 Aetna St., Salem, O.
Demuth & Sons, Charles, 245 Elm Place, Mineola, L. I., N. Y.
Dersch, Gesswein & Neuert, Inc., 4849 W. Grand Ave., Chicago 39, Ill.
Desmond-Stephan Mfg. Co., Urbana, O.
Desolvo Co., The, 719 Foreland St., Pittsburgh 12, Pa.
d'Este Div., Kaye & MacDonald, Inc., 11-15 Central Ave., West Orange, N. J.
De-Tec-Tronic Laboratories, Inc., 1711 W. Terra Cotta, Chicago, Ill.
Detroit Brass & Malleable Co., 100 S. Campbell, Detroit 9, Mich.
Detroit Controls Corp., 5900 Trumball Ave., Detroit 8, Mich.
Detroit Deisel Engine Div., General Motors Corp., 13400 W. Outer Dr., Detroit 28, Mich.
Detroit Hoist & Machine Co., 8200 Morrow St., Detroit 11, Mich.
Detroit Stamping Co., 350 Midland Ave., Detroit 3, Mich.
Detroit Stoker Co., Fifth Floor, General Motors Bldg., Detroit 2, Mich.
Deutsch Co., The, 7000 Avalon Blvd., Los Angeles 3, Calif.
Devenco, Inc., Swingfire Div., 150 Broadway, New York 38, N. Y.
Devices, Inc., 214 E. 53 St., New York 22, N. Y.
DeVilbiss Co., The, 300 Phillips Ave., Toledo 1, O.
Devine Mfg. Co., Inc., J. P., 49th and A.V.R.R., Pittsburgh 1, Pa.
Devoe & Raynolds Co., Inc., 44th St. and 1st Ave., New York 17, N. Y.
Dewey-Shepard Boiler Co., 1311 N. Capitol Ave., Indianapolis, Ind.
De Zurik Shower Co., Sartell, Minn.
Dialight Corp., 60 Stewart Ave., Brooklyn 37, N. Y.
Diamond Chain Co., Inc., 438 Kentucky Ave., Indianapolis 7, Ind.
Diamond Chemical Products, 17 E. 48th St., New York 17, N. Y.
Diamond Expansion Bolt Co., Inc., 500 North Ave., Garwood, N. J.
Diamond Machine Tool Co., 5111 Coffman-Pico Rd., Pico, Calif.
Diamond Mfg. Co., 253 W. Eighth St., Wyoming, Pa.
Diamond Power Specialty Corp., P. O. Box 415, Lancaster, O.
Diceler Div. of General Machine & Mfg. Co., Blair St. and Spring Garden Ave., Berwick, Pa.
Dick Co., Inc., R. & J., 24-48 Sade St., Passaic, N. J.
Dickson Co., The, 7420 Woodlawn Ave., Chicago 19, Ill.
Diehl Mfg. Co., Finderne Plant, 1106 Finderne Ave., Somerville, N. J.
Dielectric Products Corp., Inc., 125 Virginia Ave., Jersey City 5, N. J.
Diesel Oil Burner Corp. of New York, 105-20 New York Blvd., Jamaica, Long Island, N. Y.
Dietzgen Co., Eugene, 2425 Sheffield Ave., Chicago 14, Ill.
Dillon Co., Inc., W. C., 14620 Keswick St., Van Nuys, Calif.
Dillon Steam Boiler Wks., Inc., D. M., Crocker St., Fitchburg, Mass.
Dings Magnetic Separator Co., 4740 W. Electric Ave., Milwaukee 46, Wis.
Division Lead Co., 7742 W. 61st Pl., Summit, Ill.
Dixon Crucible Co., Joseph, Wayne & Monmouth Sts., Jersey City 3, N. J.
DoAll Co., The, 254 N. Laurel Ave., Des Plaines, Ill.
Dockson Corp., 3839 Wabash Ave., Detroit 8, Mich.
Dockstader, Inc., S. E., 1128 Munsey Bldg., Washington 4, D. C.
Dodge Mfg Corp., 500 S. Union St., Mishawaka, Ind.
Doerr Electric Corp., Cedarburg, Wis.

Dole Refrigerating Co., 5910 N. Pulaski, Chicago 30, Ill.
Dole Valve Co., The, 1933 Carroll Ave., Chicago 12, Ill.
Dollinger Corp., 9 Centre Park, Rochester 3, N. Y.
Domestic Pump & Mfg. Corp., Shippensburg, Pa.
Don Mfg. Co., 6 N. Michigan Ave., Chicago 2, Ill.
Donaldson Power Ventilator Co., 11847 Vose St., N. Hollywood, Calif.
Dormeyer Industries, 3418 Milwaukee Ave., Chicago 41, Ill.
Double Seal Ring Co., 2065 Montgomery, Fort Worth, Tex.
Dover Metal Products Co., The, Canal Fulton, O.
Dover Mfg. Co., Box 498, Independence, Mo.
Dow Chemical Co., The, Midland, Mich.
Dow Corning Corp., Midland, Mich.
Dowell, Inc., P. O. Box 536, Tulsa 1, Okla.
Downingtown Iron Works, Wallace Ave., Downingtown, Pa.
Doyle & Roth Mfg. Co., Inc., Foot of 23rd St., Brooklyn 32, N. Y.
Doyle Vacuum Cleaner Co., 225 Stevens St., S. W., Grand Rapids 2, Mich.
Drage Products, Inc., 406 32nd St., Union City, N. J.
Dragert Co., Inc., C. H., Chalk Hill Rd., Dallas, Texas
Dravo Corp., Machinery Div., Dravo Bldg., Pittsburgh 22, Pa.
Drayer-Hanson, Inc., Box 2215, Terminal Annex, Los Angeles 54, Calif.
Dreier Brothers Inc., 5642 Lake Park Ave., Chicago 37, Ill.
Dreis & Krump Mfg. Co., 7404 Loomis Blvd., Chicago 36, Ill.
Dresser Mfg. Div., Dresser Industries, Inc., 49 Fisher Ave., Bradford, Pa.
Drew & Co., Inc., E. F., 13 E. 26th St., New York, N. Y.
Drico Industrial Corp., 559 West 35 St., New York 1, N. Y.
Drinkwater, Inc., Spring & Madison St., Waukegan, Ill.
Driv-Way Lite Co., P. O. Box 2850, Denver, Colo.
Drying Systems, Inc., 1812½ W. Foster Ave., Chicago 40, Ill.
Dryomatic Corp., 812 N. Fairfax St., P. O. Box 334, Alexandria, Va.
Dual-Air Fan Co., P. O. Box 169, South Elgin, Ill.
Ducon Co., The, 147 E. 2nd St., Mineola, N. Y.
Dudgeon, Inc., Richard, 789 Bergen St., Brooklyn 38, N. Y.
Dunham Co., C. A., 400 W. Madison St., Chicago 6, Ill.
Dunkirk Radiator Corp., Dunkirk, N. Y.
Duo-Therm Div., Motor Wheel Corp., Lansing 3, Mich.
du Pont de Nemours & Co., E. I., Polychemicals Dept., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Electrochemicals Dept., Wilmington 98, Del.
du Pont de Nemours & Co., Inc., E. I., Kinetic Chemicals Div., 10th and Market Sts., Wilmington 98, Del.
du Pont de Nemours & Co., E. I. Finishes Div., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Grasselli Chemicals Dept., Wilmington 98, Del.
du Pont de Nemours & Co., E. I., Photo Products Dept., Wilmington 98, Del.
Durabla Mfg. Co., 114 Liberty St., New York 6, N. Y.
Durakool, Inc., 1010 N. Main St., Elkhart, Ind.
Duraloy Co., Scottdale, Pa.
Durant Insulated Pipe Co., Warren Way & Bay Rd., Palo Alto, Calif.
Durant International Corp., Williamstown, N. J.
Duriron Co., Inc., The, 450 N. Findlay St., Dayton 1, O.
Durkee-Atwood Co., 215 N. E. 7th St., Minneapolis, Minn.
Duro Co., 537 Monument Ave., Dayton, O.
Duro-Dyne Corp., 800 Third Ave., New Hyde Park, Long Island, N. Y.
Duro Metal Products Co., 2649 N. Kildare Ave, Chicago, Ill.
Dust Filter Co., 134 S. La Salle St., Chicago 3, Ill.
Dust Suppression & Engineering Co., 154 Grove St., Lake Orion, Mich.
Dustex Corp., 1758 Walden Ave., Buffalo 25, N. Y.
Dutton Boiler Div., Hapman-Dutton Co., 623 Gibson St., Kalamazoo 6, Mich.
Dwyer Mfg. Co., F. W., 323 S. Western Ave., Chicago 12, Ill.
Dynamic Air Engineering, Inc., 7412 Maie Ave., Los Angeles 1, Calif.
Dzus Fastener Co., Inc., P. O. Box 185, Babylon, N. Y.

E

Eagan Co., Inc., Walter H., 2336-38 Fairmount Ave., Philadelphia 30.
Eagle Chemical Co., Inc., 1501 Congress St., Chicago 7, Ill.
Eagle-Picher Co., American Bldg., Cincinnati 1, O.
Eastern Air Devices, Inc., 385 Central Ave., Dover, N. H.
Eastern Industries Inc., 100 Skiff St., Hamden 14, Conn.
Eastern Stainless Steel Corp., P. O. Box 1975, Baltimore 3, Md.
Eastman Kodak Co., 343 State St., Rochester 4, N. Y.
Eaton Mfg. Co., 9771 French Rd., Detroit 13, Mich.
Ebco Mfg. Co., 265 N. Hamilton Rd., Columbus 13, O.
Ebert Electronics Corp., 212-26 Jamaica Ave., Queens Village 28, N. Y.
Eckhart Mfg. Co., Inc., 831 Lehigh Ave., Union, N. J.
Eclipse Fuel Engineering Co., 1139 Buchanan St., Rockford, Ill.
Eco Engineering Co., 12 New York Ave., Newark 1, N. J.
Econo Products Co., East Haddam, Conn.
Econocol Stoker Div. of Cotta Transmission Co., 2340 11th St., Rockford, Ill.
Economy Equipment Co., 4800 S. Hoyne, Chicago, Ill.
Economy Pumps Inc., Div. of Wheeler Mfg. Co., C. H., 19th & Lehigh, Philadelphia 32, Pa.
Economy Valve Seat Co., 1436 N. Keating, Chicago 51, Ill.
Eddington Metal Specialty Co., P. O. Box K, Eddington, Pa.
Eddy Stoker Corp., 4717 W. North Ave., Chicago 39, Ill.
Eddy Valve Co., Waterford, N. Y.
Edge Moor Iron Wks., Inc., Edge Moor 25, Del.
Edison, Inc., Thomas A., Instrument Div., 60 Lakeside Ave., West Orange, N. J.
Eds-Wil Burner Corp., 2656 Diversey Ave., Chicago 47, Ill.
Edward Valves, Inc., 1200 W. 145th St., East Chicago, Ind.
Edwards, L. V., 32 Irving Place, Rockville Center, N. Y.
Edwards Engineering Corp., Pompton Plains, N. J.
Ehret Magnesia Mfg. Co., Valley Forge, Pa.
Eiker Mfg. Co., Ogallala, Neb.
Eisler Engineering Co., Inc., 754 S. 13th St., Newark 3, N. J.
Ejay Baseboard Mfg. Co., 124 Boyd St., Winsted, Conn.
Elastic Porcelain Lining Corp., 221 Norris Dr., Rochester 10, N. Y.
Elastic Stop Nut Corp. of America, 2330 Vauxhall Rd., Union, N. J.
Elco Tool & Screw Corp., 1800 Broadway, Rockford, Ill.
Electradiant Corp., 500 Del Monte Ave., Monterey, Calif.
Electric Arc, Inc., 152 Jelliff Ave., Newark 8, N. J.
Electric Auto-Lite Co., Instrument & Gauge Div., Toledo 1, O.
Electric Controller & Mfg. Co., 2700 E. 79th St., Cleveland 4, O.
Electric Furnace-Man, Inc., Emmaus, Pa.
Electric Machinery Mfg. Co., 800 Central Ave., Minneapolis 13, Minn.
Electric Motor Corp., Div. of Howard Industries, Inc., Racine, Wis.
Electric Motors & Specialties, Inc., King & Hamsher Sts., Garrett, Ind.
Electric Sprayit Div., Thomas Industries, Inc., 1415-25 Illinois Ave., Sheboygan, Wis.
Electric Steel Foundry Co., 2141 N. W. 25th St., Portland 10, Ore.
Electriglas Corp., Bergenfield, N. J.
Electrimatic Co., Sales Affiliate, Jas. P. Marsh Corp., 3501 Howard St., Skokie, Ill.
Electro-Air Cleaner Co., 607 Hill St., Los Angeles 14, Calif.
Electro Dynamic Div. of General Dynamics Corp., Bayonne, N. J.
Electro Products Laboratories, Inc., 4501 N. Ravenswood Ave., Chicago, Ill.
Electro Rust-Proofing Corp., Belleville, N. J.
Electrol Burner Mfg. Co., Inc., 22 Union Ave., Rutherford, N. J.
Electromode Corp., 45 Crouch St., Rochester 3, N. Y.
Electro-Switch & Controls Inc., 5755 Camille Ave., Culver City, Calif.
Electro-Therm, Inc., 931 Selim Rd., Silver Spring, Md.
Electrovent Fan & Mfg. Co., 812 W. Lake St., Chicago 7, Ill.
Elgen Mfg. Co., 41-34 39th St., Long Island City 4, N. Y.
Elgin-Refinite, Div. of Elgin Softener Corp., Elgin, Ill.
Elgin Softener Corp., Elgin, Ill.
Elgo Shutter & Mfg. Co., 2738 W. Warren Ave., Detroit 8, Mich.
Elliott Co., Jeannette, Pa.
Ellis Drier Co., 2444 N. Crawford Ave., Chicago 39, Ill.
Ellis & Watts Products, Inc., 215 E. Second St., Cincinnati 2, O.
Ellison Draft Gage Co., 548 W. Monroe St., Chicago, Ill.
Elraco Engineering Co., 732 W. 58th St., Los Anegles 37, Calif.
Emerson Electric Mfg. Co., The, 8100 Florissant Ave., St. Louis 31.
Emerson Radio and Phonograph Co., 111 Eighth Ave., New York 11, N. Y.
Empire Chemical Products Co., 10 Longworth St., Newark, N. J.
Empire Ventilation Equipment Co., 35-39 Vernon Blvd., Long Island City, N. Y.
Enderle, Inc., Ltd., Frank X., 1715 San Fernando Rd., Los Angeles 65, Calif.
Engelhard, Inc., Charles, 850 Passaic Ave., East Newark, N. J.
Engineer Co., 75 West St., New York 6, N. Y.
Engineered Products Co., 6121 Morton St., Philadelphia 44, Pa.
Enterprise Engine & Machinery Co., Subsidiary of General Metals Corp., 18th & Florida Sts., San Francisco 10, Calif.
Equipoise Controls, 100 Stevens Ave., Mount Vernon, N. Y.
Erdle Perforating Co., 171 York St., Rochester 11, N. Y.
Ergolyte Mfg. Co., 3627 Lawrence St., N., Philadelphia 40, Pa.
Erickson Specialty Co., 10 Cayuga St., P. O. Box 141, Cohoes, N. Y.
Erie Bolt & Nut Co., Erie, Pa.
Erie City Iron Wks., 1450 East Ave., Erie, Pa.
Erie Tool Wks., 735 W. 12th St., Erie, Pa.
Ernst Water Column & Gauge Co., Livingston, N. J.
Ess Instrument Co., 96 S. Washington Ave., Bergenfield, N. J.
Essex Wire Corp., 1601 Wall Street, Ft. Wayne 6, Ind.
Essick Mfg. Co., 1950 Santa Fe Ave., Los Angeles 21, Calif.
Eutectic Welding Alloys Corp., 172 St. & Northern Blvd., Flushing 58, New York, N. Y.
Evans Corp., The, George River Drive at 37th St., Moline, Ill.
Evans Machine Co., Inc., 122 S. Calverton Rd., Baltimore, Md.
Even-Ray Co., Inc., 93 Tiffany Blvd., Newark 4, N. J.
Everhot Products Co., 2059 W. Carroll, Chicago 12, Ill.
Everite Pump & Mfg. Corp., 617 No. Prince St., Lancaster, Pa.
Everlasting Valve Co., 49 Fisk St., Jersey City 5, N. J.
Evis Corp. of America, 5602 Mockingbird Lane, Dallas, Tex.
Ewing Mfg. Co., 2545 N. W. 10th, Oklahoma City 7, Okla.
Excelsior Leather Washer Mfg. Co., 720-730 Chestnut St., Rockford, Ill.
Excelsior Steel Furnace Co., The, 118 S. Clinton St., Chicago 6, Ill.
Excelsior Tool & Machine Co., 31st & Ridge Ave., East St. Louis, Ill.
Extruded Plastics, Inc., New Canaan Ave., Norwalk, Conn.

F

Faber Engineering Co., Inc., Amber & Westmoreland Sts., Philadelphia 34, Pa.
Fabreeka Products Co., Inc., 222 Summer St., Boston, Mass.
Fabri-Valve Co. of America, 2100 N. Albina, Portland, Ore.
Fafnir Bearing Co., The, 37 Booth St., New Britain, Conn.
Fageol Heat Machine Co., P. O. Box 328, Kent, O.
Fairbanks Co., The, 393 Lafayette St., New York 3, N. Y.
Fairbanks Morse & Co., 600 S. Michigan Ave., Chicago 5, Ill.
Fairmont Aluminum Co., Fairmont, W. Va.
Fairmont Tool & Forging, 10611 Quincy Ave., Cleveland 6, O.
Falcon Equipment Co., 13th St., New Brighton, Pa.
Falk Corp., 3010 W. Canal St., Milwaukee 8, Wis.
Falstrom Co., 26 Falstrom Court, Passaic, N. J.
Famco Machine Co., 3114 Sheridan Rd., Kenosha, Wis.
Fano-Flame Oil Burner Corp., 3323 Olive St., Huntington Park, Calif.
Farley Sleeve & Hanger Co., 3748 E. 71st St., Cleveland, O.
Farquhar Co., A. B., Div. of The Oliver Corp., 142 N. Duke St., York, Pa.
Farr Co., P. O. Box 45187 Airport Station, Los Angeles 45, Calif.
Farrar & Trefts, 20 Milburn St., Buffalo 12, N. Y.
Farrell Associates, Charles, Valencia, Pa.

Farris Engineering Corp., 400 Commercial Ave., Palisades Park, N. J.
Farris Stacon Corp., 563 Commercial Ave., Palisades Park, N. J.
Fasco Industries, Inc., P. O. Box 509, Rochester 2, N. Y.
Fedders-Quigan Corp., 57 Tonawanda St., Buffalo 7, N. Y.
Fedders-Quigan Corp., Trenton Div., Trenton 7, N. J.
Federal Machine & Welder Co., The, Overland Ave., Warren, O.
Federal-Mogul Corp., 11031 Shoemaker St., Detroit 13, Mich.
Federal Oil Burner Co., Inc., 3620 Walnut St., Philadelphia 4, Pa.
Federated Metals Div., American Smelting & Refining Co., 120 Broadway, New York 5, N. Y.
Fee & Mason Mfg. Co., Inc., Manasquan, N. J.
Felt Products Mfg. Co., 1504 Carroll Ave., Chicago 7, Ill.
Felters Company, The, 210 South St., Boston 11, Mass.
Fenwal Inc., 130 Pleasant St., Ashland, Mass.
Ferguson & Lange Foundry Co., 1039 Willow St., Chicago, Ill.
Fern, Ralph, 2517 Boulevard Ave., Scranton 9, Pa.
Ferro Electric Products, Inc., Kirkland, Ill.
Fibercast Corp, 100 S. Lincoln, Tulsa, Okla.
Field Control Div., H. D. Conkey & Co., Mendota, Ill.
Fielden Instrument Div., Robertshaw-Fulton Controls Co., 2920 N. 4th St., Philadelphia 33, Pa.
Filtair Mfg. Co., 487 S. Van Ness Ave., San Francisco 3, Calif.
Filtrex Corp., 33-40 127th Pl., Corona 68, Long Island, N. Y.
Filtrine Mfg. Co., Inc., 53A Lexington Ave., Brooklyn 5, N. Y.
Finn & Co., Inc., T. R., 200 Central Ave., Hawthorne, N. J.
Finnigan & Co., Inc., J. J., 722 Marietta, N. W., Atlanta, Ga.
Fire-King Stoker Co., 3760 E. St. Clair, Indianapolis, Ind.
Fireline Stove & Furnace Lining Co., 1800 Kingsbury St., Chicago 14.
Fir-Tex Insulating Board Co., St. Helens, Ore.
Fischer & Porter Co., 600 Warminster Rd., Hatboro, Pa.
Fish-Schurman Corp., 70 Portman Rd., New Rochelle, N. Y.
Fisher Governor Co., 205 S. First Ave., Marshalltown, Ia.
Fisher Research Laboratory, Inc., 1961 University Ave., Palo Alto, Calif.
Fitzgibbons Boiler Co., Inc., 101 Park Ave., New York 17, N. Y.
Flagg & Co., Inc., Stanley G., 1421 Chestnut St., Philadelphia 2, Pa.
Flanders Mill, Inc., Riverhead, Long Island, N. Y.
Flemm Lead Co., Inc., Bradley Ave., & School St., Long Island City, 1, N. Y.
Flexaust Co., 100 Park Ave., New York 17, N. Y.
Flexible Metal Hose Mfg. Co., 640 W. 17th St., Costa Mesa, Calif.
Flexible Tubing Corp., Guilford, Conn.
Flexible Valve Corp., Palisades Park, N. Y.
Flexitallic Gasket Co., 918 N. 8th St., Camden 2, N. J.
Flexlock Corp., 218 Gougler Ave., Kent, O.
Flexo Supply Co., Inc., 4649 Page Blvd., St. Louis 13, Mo.
Flexonics Corp., 1391 S. Third Ave., Maywood, Ill.
Flexrock Co., 36 & Filbert Sts., Philadelphia 4, Pa.
Flight Mfg. Corp., 925 North 8th St., Camden 2, N. J.
Flintkote Co., The, 30 Rockefeller Plaza, New York 20, N. Y.
Flodar Corp., 1342 E. 45th St., Cleveland 3, O.
Flood Co., Hudson, O.
Flori Pipe Co., The, 5700 Bulwer, St. Louis 15, Mo.
Floridin Co., P. O. Box 998, Tallahassee, Fla.
Flow Corp., 283 Concord Ave., Cambridge 38, Mass.
Fluid Heat Div., Anchor Post Products, Inc., 6500 Eastern Ave., Baltimore 24, Md.
Fluid Systems, Inc., 1881 Dixwell Ave., New Haven 14, Conn.
Fluor Corp., Ltd., The, 2500 S. Atlantic Blvd., Los Angeles 22, Calif.
Fluxolder Co., 511 W. Larned, Detroit, Mich.
Flynn & Emrich Co., 301 Holliday St., Baltimore 2, Md.
Formica Co., 4614 Spring Ave., Cincinnati, O.
Forney Engineering Co., 2705 Hawes St., Dallas 9, Tex.
Forston Co., 1400 Conti Ave., Houston, Texas.
Ft. Worth Steel & Machinery Co., P. O. Box 1038, Ft. Worth, Tex.
Forty-Eight Insulations, Inc., P. O. Box 472, Aurora, Ill.
Fossum, M. H., 2086 Marshall Ave., St. Paul, Minn.
Foster Co., Benjamin, 4635 W. Girard Ave., Philadelphia 31, Pa.
Foster Engineering Co., 835 Lehigh St., Union, N. J.
Foster Pump Wks., Inc., 46-A Washington St., Brooklyn 1, N. Y.
Foster Wheeler Corp., 165 Broadway, New York 6, N. Y.
Fostoria Pressed Steel Corp., Magnetic Pump Div., Fostoria, O.
Foxboro Co., 106 Neponset Ave., Foxboro, Mass.
Fram Corp., Providence 16, R. I.
France Packing Co., 9925 Bustleton Ave., Philadelphia 15, Pa.
France Refractories Co., J. H., 1921 France Rd., Snow Shoe, Pa.
Franklin Dalmar Corp., Woodberry, Baltimore 11, Md.
Franklin Electric Co., Inc., 400 E. Spring St., Bluffton, Ind.
Franklin Plastics, Inc., Franklin, Pa.
Frasse & Co., Peter A., 17 Grand, New York, N. Y.
Frederick Iron & Steel Inc., E. 7th St., Frederick, Md.
Freed Products Co., 1510 Third Ave., Moline, Ill.
Freeman Stoker Div., Illinois Iron & Bolt Co., 914 S. Michigan Ave. Chicago 5, Ill.
Fresh'nd-Aire Co., Div. of Cory Corp., 221 N. LaSalle St., Chicago 1.
Fretz-Moon Tube Co., Inc., P. O. Box 551, Butler, Pa.
Frick Co., Waynesboro, Pa.
Fricke, Fred J., 4404 Avenida Estrellita, Albuquerque, N. M.
Friedrich Refrigerators, Inc., 1117 E. Commerce, San Antonio, Tex.
Friermood Machine Works, Converse, Ind.
Friez Instrument Div., Bendix Aviation Corp., Taylor Ave., Towson, Baltimore 4, Md.
Frigid, Inc., 128 32nd St., Brooklyn, N. Y.
Frigidaire Div., General Motors Corp., Dayton 1, O.
Frigikar Corp., 1602 Cochran, Dallas, Tex.
Frontier Bronze Corp., Packard Rd., Niagara Falls, N. Y.
Fuel Reduction Corp., 220 N. Ada St., Chicago 7, Ill.
Fuel Savers, Inc., 15th and Herr Sts., Harrisburg, Pa.
Fuelguard Co., 5643 Dyer St., Dallas 6, Tex.
Fulflo Specialties Co., Inc., The, Blanchester, O.
Fuller Co., 124 Bridge St., Catasauqua, Pa.
Fuller Co., D. William, 2320 E. 75th St., Chicago 49, Ill.
Fuller Co. of Calif., H. B., 1060 Howard, San Francisco, Calif.
Fulton Sylphon Div., Robertshaw-Fulton Controls Co., Box 400, Knoxville 1, Tenn.
Furnas Electric Co., 1041 McKee St., Batavia, Ill.

G

G. D. S. Machinery & Supply Co., Inc., 101 Walker St., New York.
G & H Mfg. Co., 3047 Amber St., Philadelphia 34, Pa.
G. M. Mfg. Co., 50 W. 3rd St., New York 12, N. Y.
G & O Mfg. Co., 138 Winchester Ave., New Haven 8, Conn.
Gaines-Collins, Quijada Tool Division, 5474-78 Alhambra Ave., Los Angeles 32, Calif.
Gallaher Co., The, 4108 Dodge St., Omaha 3, Neb.
Galv-Weld Products, 602 Cook Tower, Lima, O.
Gannon Co., Inc., Russell R., The, 5037 Beech St., Cincinnati 12, O.
Garden City Fan Co., 332 S. Michigan Ave., Chicago 4, Ill.
Garden City Industries, Inc., 900 W. Jackson Blvd., Chicago, Ill.
Garden City Instruments, Inc., 608 S. Dearborn St., Chicago 5, Ill.
Gardiner Metal Co., 2514 W. 48th Pl., Chicago 32, Ill.
Gardner-Denver Co., Quincy, Ill.
Garlock Packing Co., 50 Main St., Palmyra, N. Y.
Gas & Oil Industry Laboratories, Inc., 4 Paine Ave., Irvington, N. J.
Gasflux Co., Mansfield; O.
Gasoilair Equipment Co., P. O. Box 768, New Haven, Conn.
Gates & Co., Inc., George W., Hempstead Turnpike & Lucille Ave., Franklin Sq., L. I., N. Y.
Gates Engineering Co., P. O. Box 1711, Wilmington, Del.
Gates Rubber Co., The, 999 S. Broadway, Denver 17, Colo.
Gateway Engineering Co., 3233 W. Grand Ave., Chicago, Ill.
Gatke Corp., 228 N. LaSalle St., Chicago 1, Ill.
Gehri Co., 117 Tacoma Ave., Tacoma 3, Wash.
Gelber Co., Samuel S., 162 N. Clinton, Chicago, Ill.
Gel-Me Co., P. O. Box 293, Bloomington, Ill.
General Blower Co., 8610 Ferris Ave., Morton Grove, Ill.
General Blower Co., Inc., 6137 Market St., Philadelphia 39, Pa.
General Ceramics Corp., Chemical Equipment Div., Keasbey, N. J.
General Chemicals Div., Allied Chemical & Dye Corp., 40 Rector St., New York, N. Y.
General Controls Co., 801 Allen Ave., Glendale 1, Calif. and Skokie, Ill.
General Corporation, 3353 University Ave., Minneapolis 14, Minn.
General Electric Co., Air Conditioning Div., 5 Lawrence St., Bloomfield, N. J.
General Electric Co., Apparatus Sales Div., 1 River Rd., Schenectady 5, N. Y.
General Electric Co., Capacitor Dept., Hudson Falls, N. Y.
General Electric Co., Chemical and Metallurgical Div., 1 Plastics Ave., Pittsfield, Mass.
General Electric Co., Construction Materials Div., 1285 Boston Ave., Bridgeport 2, Conn.
General Electric Co., Lamp Div., Nela Park, Cleveland 12, O.
General Electric Co., Major Appliance Div., 301 W. Liberty St., Louisville 2, Ky.
General Filter Co., 923 Second Ave., Ames, Ia.
General Filters, Inc., 43800 Grand River, Novi, Mich.
General Fittings Co., 123 Georgia Ave., Providence 5, R. 1.
General Gas Light Co., 212 N. Park, Kalamazoo 11F, Mich.
General Heaters & Regulators Co., 4801 Railroad Ave., East Chicago, Ind.
General Heating Products Co., 7426 State Rd., Philadelphia, Pa.
General Insulating Products Co., 8821 15th Ave., Brooklyn, N. Y.
General Machine & Mfg. Co., Blair St. & Spring Garden Ave., Berwick, Pa.
General Machinery Co., 3500 Riverside Ave., Spokane 1, Wash.
General Ozone Corp., 855 W. Washington Blvd., Chicago 7, Ill.
General Plate Div., Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
General Register Corp., 14 Factory St., Cedar Grove, N. J.
General Scientific Equipment Co., 27th & Huntingdon Sts., Philadelphia 32, Pa.
Generator Sales Co., 1627 N. Damen Ave., Chicago 47, Ill.
Gerett Corp., M. A., 724 W. Winnebago St., Milwaukee 5, Wis.
Germatrol Corp., 622 Brookline Blvd., Pittsburgh 26, Pa.
Gerrard & Co., A. J., 1950 Hawthorne Ave., Melrose Park, Ill.
Gerstein & Cooper Inc., 1 W. 3rd St., South Boston, Mass.
Gerwin Industries, Inc., 214 Spring St., Michigan City, Ind.
Giannini & Co., Inc., G. M., 254 W. Colorado St., Pasadena 1, Calif.
Giant Mfg. Co., South Ave., Council Bluffs, Ia.
Gibson Industries, Inc., 965 W. Western Ave., Muskegon, Mich.
Gibson Refrigerator Co., Greenville, Mich.
Gilbert & Barker Mfg. Co., West Springfield, Mass.
Gilbert Brass Foundry Co., 5028 Farlin St., St. Louis, Mo.
Gisholt Machine Co., 1253 E. Washington Ave., Madison 10, Wis.
Glaser Lead Co., Inc., 31 Wyckoff Ave., Brooklyn, N. Y.
Glass Fibers, Inc., 1810 Madison Ave., Toledo 2, O.
Gleason-Avery, Inc., 45 Aurelius Ave., Auburn, N. Y.
Globe Phone Mfg. Co., 2 Linden St., Reading, Mass.
Globe Steel Tubes Co., 3839 W. Burnham St., Milwaukee 46, Wis.
Goder Incinerator Corp., 407 S. Dearborn St., Chicago 5, Ill.
Goethel Sheet Metal Wks., Alfred, 3218 W. Fond du Lac Ave., Milwaukee 10, Wis.
Golden Anderson Valve Specialty Co., 1232 Ridge Ave., Pittsburgh 33.
Goldens' Foundry & Machine Co., Columbus, Ga.
Gold Star Oil Burner Mfg. Co., Inc., 146 Warburton Ave., Yonkers, N. Y.
Goodall Rubber Co., 441 Whitehead Rd., Trenton, N. J.
Goodfellow Co., Inc., E. D., 496 E. Bodley Ave., Memphis, Tenn.

Goodrich Co., B. F., 548 S. Main St., Akron 18, O.
Goodrich Chemical Co., B. F., Rose Bldg., Cleveland, O.
Goodyear Tire & Rubber Co., 1144 E. Market St., Akron 16, O.
Gordon & Piatt, P. O. Box 331, Winfield, Kan.
Gorman-Rupp Industries, Inc., Belleville, O.
Gorton Heating Corp., Cranford, N. J.
Goss Gas Inc., 5209 Baum Blvd., Pittsburgh 24, Pa.
Goulds Pumps, Inc., Fall St., Seneca Falls, N. Y.
Governair Corp., 513 N. Blackwelder St., Oklahoma City 4, Okla.
Grabler Mfg. Co., 6565 Broadway, Cleveland 5, O.
Graham Mfg. Co., Inc., 415 Lexington Ave., New York 17, N. Y.
Graham Transmissions, Inc., Menomonee Falls, Wis.
Granite City Steel Co., 20th & Madison Ave., Granite City, Ill.
Grant Wilson Inc., 141 W. Jackson Blvd., Suite 1560, Chicago, Ill.
Graphic Calculator Co., 633 Plymouth Ct., Chicago 5, Ill.
Graphic Indicator Co., 1739 S. La Cienega Blvd., Los Angeles 35, Calif.
Graton & Knight Co., 356 Franklin St., Worcester 4, Mass.
Graver Water Conditioning Co., 216 W. 14th St., New York 11, N. Y.
Gray Co., Inc., Graco Square, Minneapolis 13, Minn.
Gray Metal Products, Inc., 30 Carleton St., Rochester, N. Y.
Graymills Corp., 3701-3733 Lincoln Ave., Chicago 13, Ill
Green Fire Brick Co., A. P., Mexico, Mo.
Green Fuel Economizer Co., 780 Main St., Beacon, N. Y.
Greene, Tweed & Co., North Wales, Pa.
Greenfield Tap & Die Corp., Sanderson St., Greenfield, Mass.
Greenheck Bros. Mfg. Co., Schofield, Wis.
Greenlee Tool Co., Div. of Greenlee Bros. & Co., 2136 12th St., Rockford, Ill.
Greer Hydraulics, Inc., 454 18th St., Brooklyn 15, N. Y.
Greiner Co., Emil, 20-26 N. Moore St., New York 13, N. Y.
Grief, Edward C., 64 West End Ave., Bogota, N. J.
Griffin & Co., 500 Bergman Ave., Louisville 8, Ky.
Griffith Equipment Co., Inc., 4503 Alger St., Los Angeles 39, Calif.
Grinnell Co., Inc., 260 W. Exchange St., Providence 1, R. I.
Grip Nut Co., 310 S. Michigan Ave., Chicago, Ill.
Griscom-Russell Co., The, Massillon, O.
Gross-Aire Mfg. Co., 9416 W. Milton Ave., Overland 14, Mo.
Grove Valve and Regulator Co., 65th & Hollis St., Oakland, Calif.
Guardian Electric Mfg. Co., 1621 W. Walnut St., Chicago 12, Ill.
Guardian Products Corp., 1215 E. 2nd St., Michigan City, Ind.
Guild & Garrison, Inc., 7 Dey St., Brooklyn 11, N. Y.
Gulf Oil Corp., P. O. Box 1166, Gulf Bldg., Pittsburgh 30, Pa.
Gunnite Foundries Corp., 302 Peoples Ave., Rockford, Ill.
Gustin-Bacon Mfg. Co., 210 W. 10th St., Kansas City 6, Mo.
Guth Co., Edwin F., 2615 Washington Blvd., St. Louis 3, Mo.

H

H. A. Mfg. Co., 1612 W. King St., York, Pa.
H-B Instrument Co., American & Bristol Sts., Philadelphia 40, Pa.
H & H Tube & Mfg. Co., 245-275 N. Forman Ave., Detroit 17, Mich.
H-P Products, Inc., Louisville, O.
Haering & Co., Inc., D. W., P. O. Box 6037, Harlandale Sta., San Antonio, Tex.
Haertel Co, Walter, 2840 4th Ave., S., Minneapolis, Minn.
Hagan Corp., Hagan Bldg., Pittsburgh 30, Pa.
Hager Bros., East P. O. Box 1511, Rockford, Ill.
Hague & Co., Inc., Alfred, 230 Thirty-fourth St., Brooklyn 32, N. Y.
Haines & Co., Inc., William S., Div. Sellers Injector Corp., 1010-12 1600 Hamilton St., Philadelphia 30, Pa.
Halstead & Mitchell, Bessemer Bldg., Pittsburgh 22, Pa.
Hamburg Boiler Wks., Inc., Grand St., Hamburg, Pa.
Hamer Valves, Inc., 2919 Gardenia Ave., Long Beach 6, Calif.
Hamilton Rubber Mfg. Corp., Box 361, Trenton 3, N. J.
Hammel-Dahl Co., 175 Post Rd., (Warwick), Providence 5, R. I.
Hammett Electric Mfg. Co., 209 W. 19th Terrace, Kansas City 8, Mo.
Hammond Brass Wks., Summer Blvd., Hammond, Ind.
Hampton-Cross Co., The, 120 S. 10th St., Louisville 2, Ky.
Handy & Harman, 82 Fulton St., New York 38, N. Y.
Haney Gas Burner & Engineers, 909 S. Myrtle Ave., Monrovia, Calif.
Hanna Engineering Wks., 1765 N. Elston, Chicago 22, Ill.
Hanovia Chemical & Mfg. Co., 100 Chestnut St., Newark 5, N. J.
Hansen Mfg. Co., Inc., Princeton 6, Ind.
Hanson-Gates Mfg. Co., Inc., 8 Prescott St., Reading, Mass.
Harco Corp., 16901 Broadway, Cleveland, O.
Hardinge Oil Burner & Mfg. Co., 1700 Berteau St., Chicago 13, Ill.
Hardy, Inc., Charles, 420 Lexington Ave., New York, N. Y.
Harnischfeger Corp., 4400 W. National Ave., Milwaukee 46, Wis.
Harper Co., H. M., Morton Grove, Ill.
Harrington & King Perforating Co., 5655 Fillmore St., Chicago 44, Ill.
Harris, A. R., 4548 Hohman Ave., Hammond, Ind.
Harris & Co., Arthur, 210 N. Aberdeen St., Chicago 7, Ill.
Harris Calorific Co., The, 5501 Cass Ave., N. W., Cleveland 2, O.
Harrisburg Steel Corp., 10th & Herr Sts., Harrisburg, Pa.
Harrison Radiator Div., General Motors, Lockport, N. Y.
Harry Cooling Towers, Inc., 125 Cedar St., New York 6, N. Y.
Hart & Cooley Mfg. Co., Holland, Mich.
Hart Mfg. Co., The, 116 Bartholomew Ave., Hartford 1, Conn.
Hartmann Co., Chas., 985 Dean St., Brooklyn, N. Y.
Hartwell & Son, Inc., H. N., Park Square Bldg., Boston, Mass.
Hartzell Propeller Fan Co., P. O. Box 909, Roosevelt Ave., Piqua, O.
Harvey Aluminum, 19200 S. Western Ave., Torrance, Calif.
Harvey-Whipple, Inc., Springfield, Mass.
Hasco Valve & Machine Co., 1263 N. 70th St., Milwaukee 13, Wis.
Haskell Mfg. Co., Wm. H., 24 Commerce St., Pawtucket, R. I.
Hastings Air Conditioning Co., Box 481, 108 S. Colorado Ave., Hastings, Neb.
Hastings Instrument Co., Inc., Main St., Warwick 33, Va.
Hauck Mfg. Co., 126-136 10th St., Brooklyn 15, N. Y.
Hausman Mfg. & Sales Co., Dept. HP, 3737 W. Division St., Chicago 51, Ill.
Haveg Corp., Newark, Del.
Havens Structural Steel Co., 1713 Crystal Ave., Kansas City, Mo.
Haydon Mfg. Co., Inc., Sub. General Time Instruments Corp., Torrington, Conn.
Hayes Furnace Mfg. & Supply Co., 2929 S. Fairfax Ave., Los Angeles 16, Calif.
Hays Corp., 800 E. 8th St., Michigan City 14, Ind.
Hays Mfg. Co., 801 W. 12th St., Erie, Pa.
Health Trola Div., Excel Heating & Air Conditioning Co., 3715 Belmont Ave., Chicago 18, Ill.
Healey Co., Lee, 554 W. Garfield, Glendale 4, Calif.
Healy Ruff Co., 2257 University Ave., St. Paul 4, Minn.
Heartley Machine & Tool Co., 900-8 Summit St., Toledo, O.
Heat Equipment, Not Inc., 1014 E. 75th St., Chicago 19, Ill.
Heat & Power Corp., 424 E. Saratoga Ave., Baltimore, Md.
Heat Timer Corp., 657 Broadway, New York 12, N. Y.
Heatron, Inc., 333 Eberts Lane, York, Pa.
Heatube Corp., Allegan, Mich.
Heat-X, Inc., Brewster, N. Y.
Heating Assurance, Inc., 124 E. Augusta St., Spokane 13, Wash.
Hegeler Zinc Co., P. O. Box 599, Danville, Ill.
Heil Process Equipment Corp., 12901 Elmwood Ave., Cleveland, O.
Heinemann Electric Co., Trenton, N. J.
Helical Tube Corp., 1825 Monroe Ave., N. W., Grand Rapids, Mich.
Helicoid Gage Div., American Chain & Cable Co., Inc., Bridgeport 2, Conn.
Heller Co., The, 2153 N. Superior Ave., Cleveland 14, O.
Hendley & Whittemore, 6 Blackhawk Blvd., Beloit, Wis.
Hendrick Mfg. Co., 37 Dundaff St., Carbondale, Pa.
Henkel-Clauss Co., The, Fremont, O.
Henriksen Co., C. O., 2300 S. Avers Ave., Chicago 23, Ill.
Henry Furnace Co., The, Medina, O.
Henry Valve Co., 3215 North Ave., Melrose Park, Ill.
Henry & Wright, Div. of Emhart Mfg. Co., 760 Windsor St., Hartford, Conn.
Her-Born Engineering & Mfg. Co., 212 Columbus Ave., Sandusky, O.
Herbusch Corp., The, 706 Chestnut St., 210 Title Guaranty Bldg., St. Louis 1, Mo.
Hercules Chemical Co., Inc., 332 Canal St., New York 13, N. Y.
Hercules Electric & Mfg. Co., Inc., 2500 Atlantic Ave., Brooklyn 7.
Heresite & Chemical Co., Manitowoc, Wis.
Hermon Hosmer Scott, Inc., 385 Putnam Ave., Cambridge 39, Mass.
Hersey Mfg. Co., Cor. E and 2nd Sts., South Boston 27, Mass.
Hershey Machine & Foundry Co., Motorstokor Div., Manheim, Pa.
Hertner Electric Co., The, 12690 Elmwood Ave., Cleveland 11, O.
Hetzel Roofing Products Co., 67 Maine St., Newark 5, N. J.
Hewitt-Robins Inc., Hewitt Rubber Div., 240 Kensington Ave., Buffalo 5, N. Y.
Hexdall Co., A. M., Morris, Ill.
Hi-Flow Products, Inc., 64 E. Hoffman Ave., Lindenhurst, N. Y.
Highside Chemicals Co., 10 Colfax Ave., Clifton, N. J.
Hill, E. Vernon & Co., P. O. Box 189, Lake Geneva, Wis.
Hill, Hubbell & Co., 3091 Mayfield Rd., Cleveland 18, O.
Hill, Inc., Walter P., 22183 Telegraph Rd., Detroit 19, Mich.
Hills-McCanna Co., 3023 N. Western Ave., Chicago 18, Ill.
Hilo Varnish Corp., Div. of Carpenter-Morton Co., 376 Third St., Everett 49, Mass.
Himelblau Associates, Inc., 1408 W. Harrison St., Chicago 7, Ill.
Hinde & Dauch Paper Co., P. O. Box 861, Sandusky, O.
Hindle Transformer Co., Inc., Woods Church Rd., Flemington, N. J.
Hinrichsen, Inc., A. F., 50 Church St., New York, N. Y.
Hirschman-Pohle Co., Inc., 12 Lent Ave., LeRoy, N. Y.
Hobart Bros., Co., Troy 1, O.
Hobsite Products Co., 308 Sussex St., Harrison, N. J.
Hodge Boiler Wks., 99-111 Sumner St., East Boston 28, Mass.
Hodgman Mfg. Co., Inc., 135 Washington St., Taunton, Mass.
Hoff Mfg. Co., Johnson Rd., Bethany, New Haven 15, Conn.
Hoffberger Co., C., Monument and Forrest, Baltimore 2, Md.
Hoffman Combustion Engrg. Co., 710 Marquette Bldg., Detroit, Mich.
Hoffman Specialty Mfg. Corp., 1700 W. 10th St., Indianapolis 22, Ind.
Hogan & Co., Inc., C. T., 383 Madison Ave., New York 17, N. Y.
Holby Valve Co., 1146 Second Ave., New York 21, N. Y.
Holden Fan Co., 2503 Danforth, Detroit, Mich.
Hold-Tite Valve Mfg. Co., 550 5th Ave., New York 36, N. Y.
Hollands Mfg. Co., Erie, Pa.
Holoal Mfg. Co., 525 Lynn St., Ridgewood, N. J.
Holsclaw Bros., Inc., 408 N. Willow Rd., Evansville 11, Ind.
Holtzer-Cabot Electric Motor Div., National Pneumatic Co., Inc., 125 Armory St., Boston 19, Mass.
Homestead Valve Mfg. Co., P. O. Box 348, Coraopolis, Pa.
Hood Refining Co., 182 N. Hamilton Ave., Greensburg, Pa.
Hook & Ackerman, Inc., 9 E. 40th St., New York 16, N. Y.
Hoover Co., The, Electric Motor Div., 68 Brook Ave., North Plainfield, N. J.
Hoppes Mfg. Co., Inc., 850 N. Belmont Ave., Springfield, O.
Horn Co., Inc., A. C., 10th St. & 44th Ave., Long Island City, N. Y.
Horton Mfg. Co., 1179 15th Ave., Minneapolis 14, Minn.
Hossfeld Mfg. Co., 460 W. Third St., Winona, Minn.
Hotpoint Co., 5600 W. Taylor St., Chicago 44, Ill.
Hotstream Heater Co., 2363 E. 69th St., Cleveland 4, O.
Houghton & Co., E. F., 303 W. Lehigh Ave., Philadelphia 33, Pa.
Howard Industries, Inc., Racine, Wis.
Howard Iron Wks. & Alberger Heater Div., 287 Chicago St., Buffalo 4, N. Y.
Howe Ice Machine Co., 2825 Montrose Ave., Chicago 18, Ill.
Howell Electric Motors Co., Howell, Mich.
Howes-Woods Co., 201 Bridge St., Cambridge, Mass.
Hubbell Corp., P. O. Box 700, Hawley Rd., Mundelein, Ill.
Hudson Industries, Inc., 4400 St. Aubin Ave., Detroit 7, Mich.
Humboldt Mfg. Co., 2016 N. Whipple St., Chicago, Ill.

Hungerford & Terry, Inc., Clayton, N. J.
Hunt & Son, C. B., Inc., Salem, O.
Hunter Fan and Ventilating Co., Inc., 400 S. Front St., Memphis, Tenn.
Hunter Mfg. Co., Aluminum Insulation Div., Bristol, Pa.
Hupp Corp., Globe Stamping Div., 1250 W. 76th St., Cleveland 2, O.
Huron Boiler Co., 10457 Gratiot Ave., Detroit 13, Mich.
Hussey & Co., C. G., Div. of Copper Range Co., 2850 Second Ave., Pittsburgh 19, Pa.
Huyette Co., Inc., Paul B., 401 N. Broad St., Philadelphia 8, Pa.
Hyatt Bearings Div., General Motors Corp., Harrison, N. J.
Hydraulic Mfg. Co., Kiel, Wis.
Hydrocol-Air-Sanitation, Inc., 136 Liberty St., New York, N. Y.
Hydrotherm, Inc., Clinton Ave., Northvale, N. J.
Hynes Electric Heating Div., Turbine Equipment Co., P. O. Box 578, Westfield, N. J.
Hypro Engineering Co., 700 - 39th Ave., N. E., Minneapolis, Minn.

I

Ideal Electric & Mfg. Co., E. First & Oak Sts., Mansfield, O.
Ideal Industries, Inc., 1096 Parke Ave., Sycamore, Ill.
Ilg Electric Ventilating Co., 2841 N. Crawford Ave., Chicago 41, Ill.
Illinois Bronze Powder Co., 2015 S. Clark St., Chicago 16, Ill.
Illinois Engineering Co., Div. of American Air Filter Co., Inc., 2035 S. Racine Ave., Chicago 8, Ill.
Illinois Malleable Iron Co., 1801 Diversey Parkway, Chicago 14, Ill.
Illinois Oil Products, Inc., 4th Ave. and 24th St., Rock Island, Ill.
Illinois Testing Laboratories, Inc., 420 N. La Salle St., Chicago 10.
Illinois Water Treatment Co., 840 Cedar St., Rockford, Ill.
Illinois Zinc Co., 2959 W. 47th St., Chicago 32, Ill.
Imperial Brass Mfg. Co., 1200 W. Harrison St., Chicago 7, Ill.
Imperial Electric Co., 64 Ira Ave., Akron, O.
Incinerator Products Co., 687 S. Post, Detroit 17, Mich.
Independent Blade Corp., P. O. Box 1482, Joliet, Ill.
Independent Register Co., 3747 E. 93rd St., Cleveland 5, O.
Indiana Fan Company, 427 S. Alabama St., Indianapolis 4, Ind.
Industrial Acoustics Co., Inc., 341 Jackson Ave., New York 54, N. Y.
Industrial Engineering Corp., Terre Haute, Ind.
Industrial Engineering & Equipment Co., 711 S. Theresa Ave., St. Louis 3, Mo.
Industrial Filter & Pump Co., 5900 W. Ogden Ave., Chicago 50, Ill.
Industrial Mfg. & Engineering Co., 3033 W. Belmont Ave., Chicago 18, Ill.
Industrial Metal Protectives, Inc., 401 Homestead Ave., Dayton 8, O.
Industrial Plastics Fittings Co., 3891 W. 150th St., Cleveland, O.
Industrial Screw Co., 711 W. Lake St., Chicago 6, Ill.
Industrial Service Laboratories, 7656 W. Forest Home Ave., Milwaukee 14, Wis.
Industrial Sound Control, Inc., 45 Granby St., Hartford 12, Conn.
Infra Insulation, Inc., 525 Broadway, New York, N. Y.
Ingersoll-Rand Co., 11 Broadway, New York 4, N. Y.
Ingersoll Steel Div., Borg-Warner Corp., 310 S. Michigan Ave., Chicago 4, Ill.
Inland Steel Co., 38 S. Dearborn St., Chicago 3, Ill.
Inland Steel Products Co., 4029 W. Burnham St., Milwaukee 1, Wis.
Inner-Tite Div. of Yara Engineering Corp., 18 W. Jersey St., Elizabeth 4, N. J.
Instant Drying Corp., 101 Park Ave., New York, N. Y.
Insto-Gas Corp., 1977 E. Woodbridge St., Detroit 7, Mich.
Instruments, Inc., P. O. Box 556, Tulsa, Okla.
Insulite Div. Minnesota and Ontario Paper Co., 500 Investors Bldg., Minneapolis 2, Minn.
Insul-Mastic Corp., Oliver Bldg., Pittsburgh, Pa.
Inter-Coastal Paint Corp., 13th St. and Southern R. R., East St. Louis Ill.
Interchemical Corp., Finishes Div., 224 McWhorter St., Newark 1.
International Air Conditioner Cover, 39 St. Jones St., New York 12, N. Y.
International Boiler Works Co., The, 5 Birch St., East Stroudsburg, Pa.
International Business Machines Corp., 590 Madison Ave., New York 22, N. Y.
International Engineering, Inc., 1145 Bolander Ave., Dayton 1, O.
International Forge Co., Chicago, Ill.
International Heater Co., 101 Park Ave., Utica 2, N. Y.
International Insulations, Inc., 7 E. 42nd St., New York 17, N. Y.
International Mfg. Co., 600 E. Grand Ave., Oklahoma City, Okla.
International Metal Hose Co., 4445 Humbolt, Detroit, Mich.
International Metal Products Co., Phoenix, Ariz.
International Nickel Co., Inc., The, 67 Wall St., New York 5, N. Y.
International Powder Metallurgy Inc., Ridgway, Pa.
International Register Co., 2620 W. Washington Blvd., Chicago 12, Ill.
International Sales Co., 2045 Evans Ave., San Francisco 24, Calif.
International Steel Co., 1545 Edgar St., Evansville, Ind.
International Vermiculite Co., Girard, Ill.
Interstate Sales Co., 123 E. 18th St., New York 3, N. Y.
Iona Ventilator Co., Inc., 2821-29 W. Dauphin St., Philadelphia 32.
Iron City Chemical Co., Glycolator Division, Valencia, Pa.
Iron Fireman Mfg. Co., 3170 W. 106 St., Cleveland 11, O.
Iron Lung Ventilator Co., 5403 Prospect Ave., Cleveland 3, O.
Irvington Varnish and Insulator, Div. of Minnesota Mining & Mfg. Co., 6 Argyle Terrace, Irvington 11, N. J.
Isoflex Corp., 947 Broadway, Redwood City, Calif.
Isolantite Mfg. Co., Stirling, N. J.
Iwan Brothers, Inc., 1503 Prairie Ave., South Bend 14, Ind.

J

J O Mfg. Co., 8442 Otis St., South Gate, Calif.
Jabsco Pump Co., 2031 Lincoln St., Burbank, Calif.
Jack & Heintz, Inc., 17600 Broadway, Cleveland 1, O.
Jackes-Evans Mfg. Co., Controls Div., 4427 Geraldine Ave., St. Louis 15, Mo.
Jackson & Church Co., 321 N. Hamilton Ave., Saginaw 65, Mich.
Jaco Devices Co., 100 High St., Hingham, Mass.
Jacobs Co., Inc., B. & J., 1729 John St., Cincinnati 14, O.
Jacuzzi Bros., Inc., 5327 Jacuzzi Ave., Richmond, Calif.
Jaden Mfg. Co., 1601 Second St., Hastings, Neb.
James-Pond-Clark, 2181 E. Foothill Blvd., Pasadena 8, Calif.
Jamieson Mfg. Co., 819 Bedford, Dallas, Tex.
Jan-Air, Inc., Richmond, Ill.
Janette Elect. Mfg. Co., Lehigh at Main, Morton Grove, Ill.
Jefferson Electric Co., 25th & Madison St., Bellwood, Ill.
Jefferson Union Co., 607 W. 26th St., New York 1, N. Y.
Jeffrey Mfg. Co., 859 N. Fourth St., Columbus 16, O.
Jenkins Bros., 100 Park Ave., New York 17, N. Y.
Jenn-Air Products Co., 515 Architects Bldg., Indianapolis 4, Ind.
Jennison Co., 87 Putnam St., Fitchburg, Mass.
Jerry Finn Engineers, 634 Grand Ave., St. Paul 5, Minn.
Jessop Steel Co., Washington, Pa.
Jet-Lube, Inc., 3093 N. California St., Burbank, Calif.
Jewel Mfg. Co., 1841 University Ave., St. Paul 4, Minn.
Jiffy Covers, Inc., Chatham Phenix Bldg., Long Island City 1, N. Y.
Johns-Manville, 22 E. 40th St., New York 16, N. Y.
Johnson Bronze Co., 460 S. Mill St., New Castle, Pa.
Johnson Co., S. T., Church Rd., Bridgeport, Pa.
Johnson Corp., The, 806 Wood St., Three Rivers, Mich.
Johnson Gas Appliance Co., 520 "E" Ave., N. W., Cedar Rapids, Ia.
Johnson Heater Corp., 1 Winnisimet St., Chelsea, Mass.
Johnson Machine Works, 619 Menomonie St., Eau Claire, Wis.
Johnson March, 1724 Chestnut St., Philadelphia 3, Pa.
Johnson Mfg. Co., Inc., Mt. Vernon, Ia.
Johnson Metal Hose, Inc., 10 Sperry St., Waterbury 20, Conn.
Johnson Plastics Corp., Chagrin Falls, Ohio.
Johnson Service Co., 507 E. Michigan St., Milwaukee 2, Wis.
Johnson-Williams Ltd., 2625 Park Blvd., Palo Alto, Calif.
Johnston Bros., Inc., Ferrysburg, Mich.
Johnston & Chapman Co., 2925 Carroll Ave., Chicago 12, Ill.
Johnston & Jennings Co., 6917 Bessemer Ave., Cleveland 27, O.
Johnston Foil Mfg. Co., 6100 S. Broadway, St. Louis 11, Mo.
Johnston Pump Co., P. O. Bin "K", Pasadena 15, Calif.
Jones Foundry & Machine Co., W. A., 4401 Roosevelt Rd., Chicago.
Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa.
Jordan & Co., Inc., Paul R., 311 E. South St., Indianapolis 25, Ind.
Jordan Regulator Corp., 6013 Wiehe Ave., Cincinnati, O.
Jordan Refrigerator Co., Inc., 7900 Tabor Rd., Philadelphia 11, Pa.
Joy Mfg. Co., Dept. 20, Henry W. Oliver Bldg., Pittsburgh 22, Pa.
Justrite Mfg. Co., 2061 N. Southport Ave., Chicago 14, Ill.
Justus Steam Trap Co., Napanoch, N. Y.

K

K-G Equipment Co., 1744 Lehigh St., Allentown, Pa.
KSM Products, Inc., Yale & Woodland Ave., Merchantville, N. Y.
Kainer & Co., 763 W. Lexington St., Chicago 7, Ill.
Kaiser Aluminum & Chemical Corp., 1924 Broadway, Oakland 12, Calif.
Kaiser Co., E. B., 2114 W. Lake Ave., P. O. Box 276, Glenview, Ill.
Kaiser Co., H. S., 3336 Franklin Blvd., Chicago, Ill.
Kalamazoo Tank & Silo Co., Machine Tool Div., 500 Harrison St., Kalamazoo 16, Mich.
Kane Mfg. Corp., Kane, Pa.
Kasson Die & Motors Corp., 32-14 Northern Blvd., Long Island City 1, N. Y.
Kates Co., W. A., The, 430 Waukegan Rd., Deerfield, Ill.
Kauffman Air Conditioning Corp., 4505 Olive St., St. Louis 8, Mich.
Kaufman Co., H. J., The, 13215 Roselawn Ave., Detroit 4, Mich.
Kaul Clay Mfg. Co., The, Toronto, O.
Kaustine Furnace & Tank Corp., 1492 Washington Ave., Perry, N. Y.
Kawneer Co., Niles, Mich.
Kaye & McDonald, Inc., 11-15 Central Ave., West Orange, N. J.
Kaylo Div., Owens-Illinois Glass Co., Box 1035, Toledo 1, O.
Keasbey Co., Robert A., 139-149 W. 19th St., New York, N. Y.
Keasbey & Mattison Co., Butler Ave., Ambler, Pa.
Keckley Co., O. C., 400 W. Madison St., Chicago 6, Ill.
Keco Industries, Inc., 2832 Spring Grove Ave., Cincinnati, O.
Keeler Co., E., 238 West St., Williamsport 3, Pa.
Keeney Mfg. Co., Main St., Newington 11, Conn.
Kehm Corp., The, 5000 S. Halsted St., Chicago, Ill.
Kelbe-Nolds, Inc., 2806 Canton St., Dallas, Tex.
Keleket X-Ray Corp., 212 W. 4th St., Covington, Ky.
Keller Tool Co., P. O. Box 268, Grand Haven, Mich.
Kellogg Co., M. W., The, 225 Broadway, New York 7, N. Y.
Kemp Mfg. Co., C. M., 405 E. Oliver St., Baltimore, Md.
Kenco Pump Co., 1125 North Ridge Rd., Lorain, O.
Kenite Laboratory, Inc., 23 Samson Ave., P. O. Box 268, Madison, N. J.
Kenmore Machine Products, Inc., 15 Depew Ave., Lyons, N. Y.
Kennard Corp., 1819 S. Hanley Rd., St. Louis 17, Mo.
Kennedy Valve Mfg. Co., The, Elmira, N. Y.
Kenney Co., L. C., 2300 W. 59th St., Chicago 36, Ill.
Kensico Tube Co., Mt. Kisco, N. Y.
Kent-Moore Organization, Inc., General Motors Bldg., Detroit, Mich.
Ken-Way Corp., Sparta, Wis.
Kerentoff, G. L., 2218 Reading Rd., Cincinnati 2, O.
Kern Co., John A., 224 N. Loomis St., Chicago 7, Ill.
Kerotest Mfg. Co., 2525 Liberty Ave., Pittsburgh 22, Pa.
Kester Solder Co., 4201 Wrightwood Ave., Chicago 39, Ill.
Kewanee-Ross Corp., 101 Franklin St., Kewanee, Ill.

Kewaunee Mfg. Co., Adrian, Mich.
Key Co., 2617 McCasland, East St. Louis, Ill.
Keystone Asphalt Products Co., 101 E. Ontario St., Chicago 11, Ill.
Keystone Carbon Co., Inc., 1935 State St., St. Marys, Pa.
Keystone Tool Corp., P. O. Box 6716, Houston 5, Tex.
Kidder Mfg. Co., Inc., J. F., 426 Colchester Ave., Burlington, Vt.
Kieley & Mueller, Inc., 64 Genung St, Middletown, N. Y.
Kilbury Mfg. Co., Inc., 14529 Hawthorne Blvd., Lawndale, Calif.
Kilgore, Inc., Westerville, O.
Kimberly-Clark Corp., Neenah, Wis.
Kindl-Aire Corp., 1480 W. 112th St., Cleveland, Ohio
King Co., The, 928 N. Cedar St., Owatonna, Minn.
King Engineering Corp., 945Willard Ave., Ann Arbor, Mich.
King Refrigerator Co., 76-02 Woodhaven Blvd., Glendale, N. Y.
King Union Co., Inc., Hillsgrove, R. I.
Kingsford Foundry & Machine Wks., 264 W. Second St., Oswego, N. Y.
Kingston Products Corp., 1415 N. Webster, Kokomo, Ind.
Kinney Mfg. Div., The New York Air Brake Co., 3529 Washington St., Boston 30, Mass.
Kirk & Blum Mfg. Co., 3120 Forrer St., Cincinnati 9, O.
Kirsch Co., Refrigeration Div., Sturgis, Mich.
Kisco Boiler & Engineering Co., 2314 Dekalb St., St. Louis 4, Mo.
Klauer Mfg. Co., 9th and Washington Sts., Dubuque, Ia.
Kleenaire Corp., 409 Jefferson St., Stevens Point, Wis.
Klenk's Aviation Snips, 107 E. 5th St., Wilmington, Del.
Kling Bros., Engineering Works, 1320 N. Kostner Ave., Chicago 51, Ill.
Klipfel Valves, Inc., 1075 Lincoln Ave., Hamilton, O.
Kluegel & Co., E., 187 W. Kellogg Blvd., St. Paul, Minn.
Knapp Bros. Mfg. Co., Inc., 16 East 72nd St., Cincinnati 16, O.
Knight, Maurice A., Kelly Ave., Akron 9, O.
Knights Co., James, Sandwich, Ill.
Knowles Mushroom Ventilator Co., 160 Bellevue Ave., Upper Montclair, N. J.
Kobe Inc., Div. of Dresser Equipment Co., Huntington Park, Calif.
Koch Refrigerators, Inc., 600 E. 14th Ave., North Kansas City 16, Mo.
Kody Blower Co., 1150 Southard St., Trenton 5, N. J.
Kol-Master Corp., 161 Walberg St., Oregon, Ill.
Kool-Kar Co., Inc., 1468 Penobscot Bldg., Detroit, Mich.
Kool-Sleep, Inc., Cambridge, O.
Kopperman & Sons, Joseph, 316 New St., Philadelphia 6, Pa.
Koppers Co., Inc., Koppers Bldg., Pittsburgh 19, Pa.
Koppers Company, Inc., Metal Products Div., 200 Scott St., Baltimore 3, Md.
Korfund Co., Inc., 48-01-F 32nd Pl., Long Island City 1, N. Y.
Koven & Bro., L. O., Inc, 154 Ogden Ave., Jersey City 7, N. J.
Kraissl Co., Inc., The, Terhune and Williams Aves., Hackensack, N .J.
Kramer Trenton Co., N. Olden & Breunig Aves., Trenton 5, N. J.
Kraus Co., Walter S., 48-02 43rd St., Woodside 77, N. Y.
Krehbiel Co., J. H., 425 N. Crawford Ave., Chicago, Ill.
Kritzer Radiant Coils, Inc., 2901 W. Lawrence Ave., Chicago 25, Ill.
Krueger Air Conditioning Co., 19 E. Rillito St., Tucson, Ariz.
Krueger Sentry Gauge Co., 1056 W. Mason St., Green Bay, Wis.
Kuhns Bros. Co., 1800 McCall St., Dayton 8, O.
Kulka Electric Mfg. Co., 633 S. Fulton Ave., Mt. Vernon, N. Y.
Kunkle Valve Co., 121 S. Clinton St., Ft. Wayne 2, Ind.
Kwikon Co., 1850 W. Washington, Chicago 12, Ill.

L

LaBour Co., Inc., The, 1301 Sterling Ave., Elkhart, Ind.
Laclede-Christy Co., 2000 Hampton Ave., St. Louis 10, Mo.
Laclede Steel Co., Arcade Bldg., Rm. 1317, St. Louis 1, Mo.
Laclede Stoker Co., 4438 Hunt Ave., St. Louis 10, Mo.
La Crosse Steel Roofing & Corrugating Co., 227 Jay St., La Crosse, Wis.
Ladish Co., 5300 S. Packard Ave., Cudahy, Wis. (Milwaukee Suburb).
Ladish Co., Tri-Clover Div., 2809 60th St., Kenosha, Wis.
LaFavorite Rubber Mfg. Co., 256 Wagaraw Rd., Hawthorne, N. J.
Laharco Industries, 721-2nd Ave., N., Minneapolis 5, Minn.
Lake Chemical Co., 3052 W. Carroll Ave., Chicago 12, Ill
Lakewood Engineering & Mfg. Co., 1756 W. Lake St., Chicago 12, Ill.
Lamb Electric Co., Kent, O.
Lammert & Mann Co., Wood & Walnut Sts., Chicago 12, Ill.
Lamson Corp., Blower Div., Syracuse 1, N. Y.
Lamson & Sessions Co., The, 1971 W. 85th St., Cleveland 2, O.
Lancaster Heat Transfer Co., Inc., 123 DeKalb Ave., Brooklyn, N. Y.
Lancaster Pump & Mfg. Co., Manheim Rd., Lancaster, Pa.
Landis & Gyr, Inc., 45 W. 45th St., New York 36, N. Y.
Landis Machine Co., Inc., Fifth and Church Sts., Waynesboro, Pa.
Lane Shur-Grip Tool Co., 1420 S. Michigan Ave., Chicago 5, Ill.
Larkin Coils, Inc., 519 Memorial Dr., S. E., Atlanta 1, Ga.
Larkin Packer Co., Inc., 6200 Maple Ave., St. Louis 14, Mo.
Lastik Products Co., Inc., 201 Iroquois Bldg., Pittsburgh 13, Pa.
Lattner Mfg. Co., P. M., 1411-9th St., S. W., Cedar Rapids, Iowa
Lau Blower Co., 2001 Home Ave., Dayton 7, O.
Lawler Automatic Controls, Inc., 453 N. MacQuesten Pkwy., Mount Vernon, N. Y.
Lawrence Pumps Inc., 371 Market St., Lawrence, Mass.
Lawrence Pump & Engine Co., P. O. Box 70, Lawrence, Mass.
Layne & Bowler, Inc., Box No. 6697, Hollywood Sta., Memphis 8, Tenn.
Leach Relay Co., 5915 Avalon Blvd., Los Angeles 3, Calif.
Lead Lined Iron Pipe Co., 1 Broadway, Wakefield, Mass.
Leahy Mfg. Co., Los Angeles, Calif.
Leavitt Machine Co., East River St., Orange, Mass.
Lecourtenay Co., 5 Maine St., Newark 5, N. J.
Ledeen Mfg. Co., 1600 S. San Pedro St., Los Angeles 15, Calif.
Lee Co., K. O., Aberdeen, S. D.
Lee Corp., P. O. Box 1801, Wilmington, Del.
Lee & Son, Thomas, 128-132 W. Second St., Cincinnati 2, O.
Lee Vine Fin-Tube Radiator Co., Inc., 10 Fair St., New Haven, Conn.
Leeds & Northrup Co., 4970 Stenton Ave., Philadelphia 44, Pa.
Lees, John, Div., The, Serrick Corp., Batavia St. and Kilgore Ave., Muncie, Ind.
Leffel & Co., James, 426 East St., Springfield, O.
Lehigh Fan & Blower Co., 17th and Sumner Ave., Allentown, Pa.
Lehigh Mfg. Co., Div. of Lehigh Foundries, Inc., Lancaster, Pa.
Leibfried Mfg. Corp., C. H., 95 Guernsey, Brooklyn, N. Y.
Leiman Bros., Inc., 163 W. Christie St., Newark, N. J.
Leland Electric Co., The, Div. of American Machine & Foundry Co., 1501 Webster St., Dayton 1, O.
Lenk Mfg. Co., 30 Cummington St., Boston 15, Mass.
Lennox Furnace Co., 1711 Olentangy River Rd., Columbus, O.
Leonard Valve Co., 1360 Elmwood Ave., Cranston 9, R. I.
Leslie Co., 237 Grant Ave., Lyndhurst, N. J.
Leslie Welding Co., Inc., 2943 Carroll Ave., Chicago 12, Ill.
Levow, David, 308 W. 20th St., New York 11, N. Y.
Lewellen Mfg. Co., Columbus, Ind.
Lewin-Mathes Co., Lewin Metals Div., 1111 Chouteau Ave., St. Louis 2, Mo.
Lewis & Co., Inc., Chas. S., 2207 Pine St., St. Louis 3, Mo.
Lewis & Co., Joseph E., 1319 Carroll St., Baltimore, Md.
Lexsuco, Inc., 4815 Lexington Ave., Cleveland 3, O.
Leyman Mfg. Corp., John H. McGowan Co. Div., 1416 First National Bank Bldg., Cincinnati 2, O.
Libbey-Owens-Ford Glass Co., Nicholas Bldg., Toledo 3, O.
Libert Machine Co., 324 N. Roosevelt St., Green Bay, Wis.
Lieblich Oil Burner Inc., 36 W. 66th St., New York, N. Y.
Lientz Co., B. P., P. O. Box 2275, Kansas City, Mo.
Lilie-Hoffmann Cooling Towers, Inc., 4239 Duncan Ave., St. Louis 10, Mo.
Lima Electric Motor Co., The, Lima, O.
Lima Register Co., The, 651 N. Baxter St., Lima, O.
Lincoln Electric Co., The, 22801 St. Clair Ave., Cleveland 17, O.
Linde Air Products Co., A Div. of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
Lindsay Structure, Inc., 5000 W. Dempster St., Skokie, Ill.
Lindy Heaters, Inc., 2370 Hoffman St., New York 58, N. Y.
Line Material Co., 700 W. Michigan, Milwaukee, Wis.
Linear Incorporated, N. W. Cor. State Rd. & Levick St., Philadelphia 35, Pa.
Link-Belt Co., 307 N. Michigan Ave., Chicago 1, Ill.
Link-Belt Co., 2045 W. Hunting Park Ave., Philadelphia, Pa.
Lintern Corp., Route 20 East, Painesville, O.
Lipman Refrigeration Div., Yates-American Co., Beloit, Wis.
Liquid Carbonic Corp., 3100 S. Kedzie Ave., Chicago 23, Ill.
Liquidepth Indicators, Inc., 43-22 Tenth St., Long Island City 1, N. Y.
Liquidometer Corp., 37-15 Skillman Ave., Long Island City 1, N. Y.
Lissberger & Son, Inc., Marks, 23-01 Borden Ave., Long Island City, N. Y.
Lithcote Corp., 333 W. 40th Pl., Chicago 9, Ill.
Little Giant Vaporizer Co., Inc., 5105 Classen Blvd., P. O. Box 3535, Oklahoma City 6, Okla.
Little Mfg. Co., M. S., 151 New Park Ave., Hartford 6, Conn.
Littleford Bros., Inc., 453 E. Pearl St., Cincinnati 2, O.
Livesay Window Co., 3044 S. W. 28th Lane, Miami, Fla.
Livingstone Engineering Co., 100 Grove St., Worcester 5, Mass.
Locke Regulator Co., Walter and Osborne Sts., Salem, Mass.
Lockformer Co., The, 4615 W. Roosevelt Rd., Chicago 50, Ill.
Lockjoint Wood Products Co., 1114 S. Sante Fe, Wichita 11, Kan.
Locknut Corp. of America, 3403 W. 47th St., Chicago 32, Ill.
Lockport Mills, Inc., Lockport, N. Y.
Logan Clay Products Co., The, Logan, O.
Logan Engineering Co., Lawrence & Lamon Ave., Chicago 30, Ill.
London Chemical Co., 325 W. 32nd St., Chicago, Ill.
Lonergan Mfg. Co., Edison & Clark Sts., Albion, Mich.
Longergan Co., J. E., 2nd and Race Sts., Philadelphia 6, Pa.
Lookout Boiler & Mfg. Co., Compress St. & Mfrs. Rd., Chattanooga 1, Tenn.
Lord Mfg. Co., 1635 W. 12th St., Erie, Pa.
Lord & Clark Co., Inc., 791 Tremont St., Boston 18, Mass.
Louisville Drying Machinery Unit, General American Transportation Corp., 139 So. 4th St., Louisville 2, Ky.
Louvra Corp., The, 1010 Jeanette Ave., Union, N. J.
Lovejoy Flexible Coupling Co., 4987 W. Lake St., Chicago 44, Ill.
Lowell Wrench Co., 54 Commercial St., Worcester 8, Mass.
Loyal Knight Stokers, Inc., 800 Scheel St., Belleville, Ill.
Lucey Boiler & Mfg. Corp., 1514 Chestnut St., Chattanooga, Tenn.
Ludlow Valve Mfg. Co., Inc., Foot of Adams St., Troy, N. Y.
Lufkin Rule Co., Saginaw, Mich.
Lug-All Co., The, Wynnewood 29, Pa.
Lukens Steel Co. and Divisions, 308 S. First Ave., Coatesville, Pa.
Luminous Ceilings, Inc., 2500 W. North Ave., Chicago 47, Ill.
Lumm Co., A. H., 2512 Albion St., Toledo 6, O.
Lumsden & Van Stone, Div. of Midwest Piping Co., Inc., 426 First St., South Boston 27, Mass.
Lunkenheimer Co., Waverly & Beckman Sts., Cincinnati 14, O.
Lurie & Lurie, 126 N. Union St., Chicago, Ill.
Lustra Corp. of America, 36 Washington St., Brooklyn, N. Y.
Luzerne Rubber Co., Muirhead Ave., Trenton 7, N. J.
Lynch Asbestos Co., 2939 So. Sunol Drive, Los Angeles 23, Calif.
Lynch Corp., Crystal & Ames St., Anderson, Ind.
Lynchburg Foundry Co., Courtland Bldg., Lynchburg, Va.
Lyon, Conklin & Co., Inc., McComas & Race Sts., Baltimore 30, Md.

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M B Mfg. Co., Inc., The, 1060 State St., New Haven 11, Conn.
M & E Mfg. Co., 2757 Winthrop Ave., Indianapolis, Ind.
M-M-A, Inc., Breneman Bldg., Lancaster, Pa.
M M M, Inc., 7120 Avenue C, Houston, Tex.
Maas & Waldstein Co., 2121 McCarter Highway, Newark 4, N. J.
MacDermid Chemical Co., Box 1041, Bristol, Conn.
Macksons Co., 125 Cedar St., New York 6, N. Y.
Mac-Lean-Fogg Lock Nut Co., 5535 N. Wolcott Ave., Chicago 40, Ill.
Madden Corp., The, 1543 Morse Ave., Chicago, Ill.
Madden Brass Products Co., 948 Oliver Ave., P. O. Box 444, Aurora, Ill.
Magic Chef, Inc., 1641 S. Kingshighway Blvd., St. Louis 10, Mo.
MaGirl Foundry & Furnace Co., 413 E. Oakland Ave., Bloomington, Ill.
Magnaflow Pump Corp., 45 Astor Place, New York 3, N. Y.
Magna-Rod, Box 736, Beloit, Wis.
Magnetic Drain Plug Co., Wellington, O.
Magnetrol, Inc., 2110 S. Marshall Blvd., Chicago 23, Ill.
Magnex Corp., 90-28 Van Wyck Expressway, Jamaica 18, N. Y.
Magnode Products, Inc., Box 292, Trenton, O.
Magnus Chemical Co., South Ave., Garwood, N. J.
Mahon Co., R. C., The, P. O. Box 4666, Detroit 34, Mich.
Mahr Mfg. Co., Div. of Diamond Iron Wks., Inc., 1728 Second St., N., Minneapolis 11, Minn.
Maid-O'-Mist, Inc., 3217 N. Pulaski Rd., Chicago 41, Ill.
Maintenance Engineering Corp., 3611 Clinton Dr., Houston, Tex.
Mall Tool Co., 7740 South Chicago Ave., Chicago 19, Ill.
Malleable Iron Fittings Co., Branford, Conn.
Mallory Sales Co., 13904 Lincoln Ave., Dolton, Ill.
Maloney Co., F. H., P. O. Box 1777, Houston, Tex.
Mammoth Furnace Co., 509 Vandalia St., St. Paul 4, Minn.
Manhattan Perforated Metal Co., Inc., 43-17 37th St., Long Island City 1, N. Y.
Manheim Mfg. & Belting Co., Manheim, Pa.
Manitowoc Shipbuilding, Inc., 16th & The River, Manitowoc, Wis.
Manning Co., Charles E., 4135 Brownsville Rd., Pittsburgh 27, Pa.
Manning & Lewis Engineering Co., 32 Ogden St., Newark 4, N. Y.
Manning, Maxwell & Moore, Inc., 250 East Main St., Stratford, Conn.
Mansfield & Green, 1051 Power Ave., Cleveland 14, O.
Manufacturers Corp., 100 W. 4th St., Mansfield, O.
Manville Boiler Co., Inc., Stiger St., Hackettstown, N. J.
Maplewood Machinery Co., Inc., 2634 Fullerton Ave., Chicago 47, Ill.
Marathon Electric Mfg. Corp., Cherry and Randolph Sts., P. O. Box 630, Wausau, Wis.
Marble-Card Electric Co., Gladstone, Mich.
Marco Co., Inc., 1000 Hess St., Saginaw, Mich.
Marco Industries, Inc., 786 Terrace Blvd., Depew, N. Y.
Marine & Industrial Products Co., 3731 Filbert St., Philadelphia 4.
Marion Machine Foundry & Supply Co., Marion, Ind.
Markal Co., 3052 W. Carroll Ave., Chicago 12, Ill.
Marley Co., The, 222 West Gregory Blvd., Kansas City 14, Mo.
Marlin-Rockwell Corp., Jamestown, N. Y.
Marlo Coil Co., 6135 Manchester Rd., St. Louis 10, Mo.
Marlow Pumps, Subsidiary of Bell & Gossett Co., Ridgewood, N. J.
Marman Products Co., Inc., 11214 Exposition Blvd., Los Angeles 64.
Marquart Mfg. Co., 1241 High St., Oakland 1, Calif.
Marquette Coppersmithing Co., Christian & Water Sts., Philadelphia 47, Pa.
Marquette Mfg. Co., 307 E. Hennepin Ave., Minneapolis 14, Minn.
Marsh Heating Equipment Co., 3501 Howard St., Skokie, Ill.
Marsh Instrument Co., 3501 Howard St., Skokie, Ill.
Marsh Valve Co., 4th St., & Brigham Rd., Dunkirk, N. Y.
Marshalltown Mfg. Co., 901 E. Nevada, Marshalltown, Ia.
Martens & Stormoen, 231 Willard St., West Quincy 69, Mass.
Martin Co., Inc., J. O., 637 Minna St., San Francisco 3, Calif.
Martin Fan & Blower Co., 4634 W. 21st Pl., Chicago 50, Ill.
Martin & Sons, H. P., 801 W. 12th St., Owensboro, Ky.
Martin Metal Products Corp., Ferndale, Mich.
Marvel Engineering Co., 625 W. Jackson Blvd., Chicago, Ill.
Mason-Neilan Regulator Co., 1190 Adams St., Boston 24, Mass.
Mass Co., 1123 W. 4½ St., Davenport, Ia.
Master Control Co., The, 2034 Fifth St., Cuyahoga Falls, O.
Mastercraft Plastics Co., 95-01 150th St., Jamaica 35, N. Y.
Master Electric Co., 126 Davis Ave., Dayton 1, O.
Master Enterprise Corp. of America, Boulder Bldg., Tulsa, Okla.
Master Mechanics Co., 2097 Columbus, Cleveland, O.
Master Vibrator Co., 361 Stanley Ave., Dayton, Ohio.
Matthiessen & Hegeler Zinc Co., 9th & Sterling Sts., La Salle, Ill.
Maurath, Inc., 21800 Miles Ave., Cleveland 22, O.
Maurey Mfg. Corp., 2911 S. Wabash Ave., Chicago 16, Ill.
Maxitrol Co., 12200 Beech Rd., Detroit 39, Mich.
Maxon Premix Burner Co., Muncie, Ind.
May Oil Burner Div., May Fuel Oil Corp., 1500 Russell St., Baltimore
Mayer Refrigerating Engineers, Inc., Lincoln Park, N. J.
Mayne Products Co., 324 Harries Bldg., Dayton 2, O.
Mayson Mfg. Co., 4332 Horatio St., Detroit 10, Mich.
Maysteel Products, Inc., 740 N. Plankinton, Milwaukee 3, Wis.
McAlear Mfg. Co., 1921 S. Western Ave., Chicago 8, Ill.
McAuley Trap Co., 104 First Ave., Pittsburgh 22, Pa.
McCord Corp., 2587 E. Grand Blvd., Detroit 11, Mich.
McCorkle Co., D. H., 6th & Bancroft Way, Berkeley 2, Calif.
McDonald Mfg. Co., A. Y., 12th & Pine Sts., Dubuque, Iowa.
McDonnell & Miller, Inc., 3500 N. Spaulding Ave., Chicago 18, Ill.
McGraw Electric Co., Clark Div., 5201 W. 65th St., Chicago 28, Ill.
McIntire Co., The, Okner Parkway, P. O. Box 5, Livingston, N. J.
McIntyre Engineering Co., Inc., 137 S. Linden Ave., South San Francisco, Calif.
McKay Co., 1005 Liberty Ave., Pittsburgh 22, Pa.
McLarty Systems, 2600 Dickman Rd., Battle Creek, Mich.
McMillan Industrial Supplies, C. C., 3912 S. W. Dolph Court, Portland 19, Oregon.
McNeill Engineering Co., 4057 W. Van Buren St., Chicago 24, Ill.
McPherson Furnace & Supply Co., 1805 N. E. Second Ave., Portland 12, Ore.
McQuay, Inc., 1600 Broadway, N. E., Minneapolis 13, Minn.
McQuay-Norris Mfg. Co., Southwest Ave. at Marconi, St. Louis 10.
McRae Corp., 750 N. Glendale Ave., Glendale 6, Calif.
McRay Products Co., 950 Mission St., South Pasadena 1, Calif.
McWane Cast Iron Pipe Co., 1201 Vanderbilt Rd., Birmingham 2, Ala.
Mears-Kane-Ofeldt, Inc., Div. S. T. Johnson Co., P. O. Box 223, Bridgeport, Pa.
Mechanical Industries Production Co., 217-223 Ash St., Akron 2, O.
Mechanical Products Corp., 168 N. Ogden Ave., Chicago 7, Ill.
Meco, Inc., 4101 S. E. 26th Ave., Portland 2, Ore.
Medart Co., 100 Potomac St., St. Louis 18, Mo.
Mefco Mfg. Co., Air Conditioning Div., 1505 Gardena Ave., Glendale 4, Calif.
Meier Electric & Machine Co., Inc., 3525 E. Washington St., Indianapolis 7, Ind.
Mel-Gauge Co., P. O. Box 126, Sta. A, New Haven, Conn.
Mel Products Co., The, 554 Chapel St., New Haven, Conn.
Meldon Industries Div., Tool Industries, Inc., 15438 Telegraph Rd., Detroit, Mich.
Memphis Pump & Mfg. Co., Memphis, Tenn.
Menardi & Co., 1222 E. Grand Ave., El Segundo, Calif.
Merchant & Evans Co., 2035 Washington Ave., Philadelphia 46, Pa.
Mercoid Corp., The, 4201 Belmont Ave., Chicago 41, Ill.
Mercury Clutch Div., Automatic Steel Products, Inc., Canton 6, O.
Meriam Instrument Co., The, 10920 Madison Ave., Cleveland 2, O.
Mesker Steel Corp., Geo. L., 400 N. W. First St., Evansville 8, Ind.
Metalcraft Inc., Mason City, Ia.
Metal Fabricators, Inc., P. O. Box 3232, Charlotte 3, N. C.
Metal Products Eng., Inc., 4000 Long Beach Ave., Los Angeles 58, Calif.
Metal & Thermit Corp., 100 E. 42nd St., New York 17, N. Y.
Metallo Gasket Co., 16 Bethany St., New Brunswick, N. J.
Metalweld, Inc., Protective Coatings Div., Scotts Lane & Abbotsford Ave., Philadelphia 29, Pa.
Metropolitan Refining Co., Inc., 50-23 Twenty-Third St., Long Island City 1, N. Y.
Mettler Co., Inc., The, 4366 Worth St., Los Angeles 63, Calif.
Meyer & Bro. Co., F., 308 S. Commercial St., Peoria 2, Ill.
Meyer Furnace Co., The, P. O. Box 989, Peoria 1, Ill.
Meyer & Wenthe, Inc., 30 S. Jefferson St., Chicago, Ill.
Michigan Pipe Co., 506 Phoenix Bldg., Bay City, Mich.
Michigan Plastic Pipe Co., 20050 Livernois St., Detroit, Mich.
Michigan Tool Co., 7171 E. McNichols Rd., Detroit, Mich.
Micro Metallic Corp., 30 Sea Cliff Ave., Glen Cove, N. Y.
Micro Products Co., 20 N. Wacker Dr., Chicago 6, Ill.
Micro Switch Div. of Minneapolis-Honeywell Regulator Co., Chicago & Spring Sts., Freeport, Ill.
Microtron Corp., P. O. Box 2092, Charlotte, N. C.
Midco Register Corp., 1059 Grand Ave., St. Paul, Minn.
Mid-Continent Metal Products Co., 1960 Clybourn Ave., Chicago 14.
Midland Paint & Varnish Co., 3802 E. 91st St., Cleveland 5, O.
Mid-States Welder Mfg. Co., 6025 S. Ashland Ave., Chicago 36, Ill.
Midwest Air Conditioning Co., 510 Third St., Des Moines, Ia.
Midwest Automatic Control Co., 510 Third St., Des Moines, Ia.
Midwest Mfg. Co., 2205 Haskell Ave., Lawrence, Kans.
Midwest Piping Co., Inc., 1450 S. Second St., St. Louis 4, Mo.
Midwest Products Co., Port Byron, Ill.
Miller Electric Mfg. Co., Inc., 718 S. Bounds St., Appleton, Wis.
Miller-Harris Instrument Co., 601 E. Ogden Ave., Milwaukee 2, Wis.
Miller Valve Co., Inc., P. O. Box 1255, Pittsburgh 30, Pa.
Millers Falls Co., 57 Wells St., Greenfield, Mass.
Mill-Rose Co., 1985 E. 59th St., Cleveland, O.
Milton Equipment Co., N. E. Cor. 4th Race St., Philadelphia 6, Pa.
Milton Roy Co., 1371 E. Mermaid Ave., Philadelphia 18, Pa.
Milwaukee Electric Tool Corp., 5316 W. State St., Milwaukee 8, Wis.
Milwaukee Gas Specialty Co., P. O. Box 461, Milwaukee, Wis.
Milwaukee Valve Co., S. Burrell St. at E. Hayes Ave., Milwaukee 7, Wis.
Mine Safety Appliances Co., 201 N. Braddock Ave., Pittsburgh 8, Pa.
Mineral Insulation Co., 103rd & Southwest Highway, Chicago Ridge, Ill.
Minerallac Electric Co., 25 N. Peoria St., Chicago 7, Ill.
Minneapolis-Honeywell Regulator Co., 2641 4th Ave., S., Minneapolis 8, Minn.
Minneapolis-Honeywell Regulator Co., Industrial Div., Wayne & Windrim Aves., Philadelphia 44, Pa.
Minnesota Mining & Mfg. Co., 900 Fauquier Ave., St. Paul, Minn.
Minnesota Mining & Mfg. Co., Adhesives & Coatings Div., 411 Piquette, Detroit, Mich.
Minnesota Rubber & Gasket Co., 3630 Wooddale Ave., Minneapolis.
Minn-Kota Foundry & Mfg. Co., P. O. Box 822, Fargo, N. D.
Miracle Adhesives Corp., 214 E. 53rd St., New York 22, N. Y.
Mir-O-Col Alloy Co., Inc., 308 North Ave., 21, Los Angeles 31, Calif.
Misener Mfg. Co., Inc., 200-8 Walton St., Syracuse 2, N. Y.
Mission Appliance Corp., 12611 Crenshaw Blvd., Hawthorne, Calif.
Mississippi Glass Co., St. Louis 7, Mo.
Mitchell Co., John E., 3800 Commerce St., Dallas, Tex.
Mitchell & Co., Inc., W. K., 29th & Ellsworth, Philadelphia 46, Pa.
Mitchell Mfg. Co., 2525 N. Clybourn Ave., Chicago, Ill.
Modern Engineering Co., 3411 Pine Blvd., St. Louis 3, Mo.
Modine Mfg. Co., 1509 De Koven Ave., Racine, Wis.
Moeller Instrument Co., 132nd St. & 89th Ave., Richmond Hill 18, N. Y.
Moeschl-Edwards Corrugating Co., Inc., The, P. O. Box 1115, Cincinnati 1, O.

Monarch Mfg. Works, Inc., 2501 E. Ontario St., Philadelphia 34, Pa.
Monash-Younker Co., Inc., 1315 W. Congress St., Chicago 7, Ill.
Moncrief Furnace Co., P. O. Box 1673, Atlanta 1, Ga.
Monitor Controller Co., The, 51 Hayward St., Boston 84, Mass.
Monogram Products Co., Inc., 731 N. 35th St., Philadelphia 4, Pa.
Monsanto Chemical Co., 800 N. 12th Blvd., St. Louis 1, Mo.
Monsanto Chemical Co., Merrimac Div., Everett Sta., Boston 49, Mass.
Montag Stove & Furnace Wks., 2011 N. Columbia Blvd., Portland 3, Ore.
Montgomery Bros., 1122 Howard St., San Francisco, Calif.
Moore Inc., Goodloe E., 2811 N. Vermilion, Danville, Ill.
Moore Co., The, P. O. Box 149, St. Louis 5, Mo.
Moore & Co., Samuel, Mantau, O.
Moore Products Co., H and Lycoming Sts., Philadelphia 24, Pa.
Moraine Products Div., General Motors Corp., Dayton 1, O.
Moran Flexible Joint Co., Inc., 3745 Crittenden Dr., Louisville, Ky.
Morehead Mfg. Co., 2455 W. Warren Ave., Detroit 8, Mich.
Moreheat Distribution Inc., 5608 Stewart Rd., Cincinnati 27, O.
Morey, Dan, Box 85, Los Angeles 35, Calif.
Morganite, Inc., Carbon Specialties Div., 3304 48th Ave., Long Island City 1, N. Y.
Morheat Corp., 700 E. Kalamazoo, Lansing, Mich.
Morris Coupling & Clamp Co., 12th and Factory Ave., Elwood City, Pa.
Morris Machine Wks., 50 E. Genesee St., Baldwinsville, N. Y.
Morris Sheet Metal Works, 635 W. Mound St., Columbus 23, O.
Morrison Brothers Co., 24th & Elm Sts., Dubuque, Ia.
Morrison Products, Inc., E. 168th St. and Waterloo Rd., Cleveland 10, O.
Morse Chain Co., 7601 Central Ave., Detroit 10, Mich.
Morse-Smith-Morse Co., The, 165 Dexter Ave., Watertown 72, Mass.
Mortell Co., J. W., Kankakee, Ill.
Morton Engineering Service, Paul S., 609 Bangor Rd., Lawrence, Mich.
Motionair Co., 3319 E. Slauson Blvd., Los Angeles 11, Calif.
Motor Products Corp., Deepfreeze Appliance Div., North Chicago, Ill.
Mt. Hawley Mfg. Co., Inc., Mt. Hawley Air Port, Peoria 4, Ill.
Mountain States Equipment Co., 1238 Speer Blvd., Denver 4, Colo.
Muckle Mfg. Co., Owatonna 3, Minn.
Mueller Brass Co., 1925 Lapeer Ave., Port Huron 1, Mich.
Mueller Climatrol, 2005 W. Oklahoma Ave., Milwaukee 15, Wis.
Mueller Co., 512 W. Cerro Gordo St., Decatur, Ill.
Mueller Steam Specialty Co., Inc., 40-20 22nd St., Long Island City 1, N. Y.
Mult-A-Frame Div., Ainsworth Mfg. Corp., 1471 E. Atwater St., Detroit 7, Mich.
Multi-Cell Sales Corp., 3420 Nicollet Ave., Minneapolis 8, Minn.
Multiplex Mfg. Co., Berwick, Pa.
Multi-Vent Div., Pyle-National Co., The, 1373 Kostner Ave., Chicago 51, Ill.
Muncie Gear Wks., Inc., 700 N. Wysor, Muncie, Ind.
Mund Boilers, Inc., 1600 N. Indiana St., Los Angeles 63, Calif.
Mundet Cork Corp., 7101 Tonnelle Ave., North Bergen, N. J.
Mundt & Sons, Charles, 53 Fairmount Ave., Jersey City 4, N. J.
Munn & Steele, Inc., Castle Island Terminal, South Boston, Mass.
Munray Products, Inc., 12400 Crossburn St., Cleveland, O.
Munton Mfg. Co., 9400 Belmont Ave., Franklin Park, Ill.
Murray Co. of Texas, The, P. O. Box 1517, Atlanta, Ga.
Murray Iron Wks. Co., 1106 Washington St., Burlington, Ia.
Murray Mfg. Co., D. J., 1002-24 Third St., Wausau, Wis.
Myers & Bro. Co., F. E., The, Ashland, O.
Myers Electric Co., Inc., 209 First Ave., Pittsburgh 22, Pa.
Mystik Adhesive Products, Div. of Chicago Show Printing Co., 2635 N. Kildare Ave., Chicago 39, Ill.

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Nash Engineering Co., 307 Wilson Ave., South Norwalk, Conn.
Nason Co., Clarkston, Mich.
Nat Corp., 2710 McGee St., Kansas City 8, Mo.
National Acme Co., The, 170 E. 131st St., Cleveland 8, O.
National Air Conditioning Inc., Johnstown, Pa.
National Airoil Burner Co., Inc., 1330 E. Sedgley Ave., Philadelphia 34, Pa.
National Aluminate Corp., 6215 W. 66th Pl., Chicago 38, Ill.
National Aniline Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
National Carbon Co., A Div. of Union Carbide & Carbon Corp., 30 E. 42nd St., New York 17, N. Y.
National Cork Co., 1 Engle Street, Englewood, N. J.
National Cylinder Gas Co., 840 N. Michigan Ave., Chicago 11, Ill.
National Engineering & Mfg. Co., 16th & Lamiece St., Sedalia, Mo.
National Engineering Products, Inc., Commerce and Savings Bldg., Washington, D. C.
National Gas Equipment Co., Inc., P. O. Box 122, Denison, Tex.
National Gypsum Co., 325 Delaware Ave., Buffalo, N. Y.
National Heater Co., 2180 Cleora Ave., St. Paul 4, Minn.
National Instrument Laboratories, Inc., 6108 Rhode Island Ave., Riverdale, Md.
National Lead Co., 111 Broadway, New York 6, N. Y.
National Lock Co., Inc., 1902 Seventh St., Rockford, Ill.
National Metal Fabricators, 2138 S. Sawyer, Chicago 23, Ill.
National Meter Co., 4221 First Ave., Brooklyn 32, N. Y.
National Oil Burner Co. of N. Y., Inc., 614 Bergen St., Brooklyn, N. Y.
National Pipe Bending Co., 122 River St., New Haven 13, Conn.
National Pipe Coatings, Inc., 3480 East Randolph St., Huntington Park, Calif.
National Radiator Co., The, 221 Central Ave., Johnstown, Pa.
National Sheet Metal Works, 324 E. 39th St., New York, N. Y.
National Steam Pump Co., 701 W. Johnson St., Upper Sandusky, O.
National Steel Construction Co., 301 Water St., Logansport, Ind.
National Time & Signal Corp., 21800 Wyoming Ave., Detroit 20, Mich.
National Tube Div., United States Steel Corp., 525 William Penn Place, Pittsburgh 30, Pa.
National Valve & Mfg. Co., 3101 Liberty Ave., Pittsburgh 1, Pa.
Naugatuck Mfg. Co., Union City, Conn.
Naylor Pipe Co., 1230 E. 92nd St., Chicago 19, Ill.
Nebel Mfg. Co., P. O. Box 3942, Shaker Square Sta., Cleveland 20, O.
Nelson Chemical Pumps, Box 2235, Casper, Wyo.
Nelson Mfg. Co., B. F., 401 Main St., N. E., Minneapolis 13, Minn.
Nelson Stud Welding Div., Gregory Industries, Inc., Lorain, O.
Neptune Meter Co., 50 W. 50th St., New York 20, N. Y.
Nesbitt, Inc., John J., State Rd. & Rhawn St., Philadelphia 36, Pa.
New Departure Div., General Motors Corp., Bristol, Conn.
New England Cooling Tower Co., 43 Field St., Quincey 69, Mass.
New Haven Copper Co., The, Seymour, Conn.
New Jersey Zinc Sales Co., Front & Fletcher Sts., New York 7, N. Y.
New York Air Valve Corp., 1850 Atlantic Ave., Brooklyn 33, N. Y.
New York Belting & Packing Co., 1 Market St., Passaic, N. J.
New York Blower Co., 3159 Shields Ave., Chicago 16, Ill.
New York Brass Foundry, 405 Broome St., New York 13, N. Y.
Newage International, Inc., 235 E. 42nd St., New York 17, N. Y.
Newark Controls Co., 15 Ward St., Bloomfield, N. J.
Newark Wire Cloth Co., 351 Verona Ave., Newark 4, N. J.
Newcomb-Detroit Co., 5741 Russell St., Detroit 11, Mich.
Newco Products, 30 E. 40th St., New York 16, N. Y.
Newport Steel Corp., Ninth & Lowell Sts., Newport, Ky.
Niagara Blower Co., 405 Lexington Ave., Room 3117, New York 17.
Niagara Industrial Corp., 20 Vesey St., New York 7, N .Y.
Niagara Machine & Tool Wks., 637-697 Northland Ave., Buffalo 11, N. Y.
Niagara Products Co., 4311 E. Thomas Rd., Phoenix, Ariz.
Nice Ball Bearing Co., 30th and Hunting Park Ave., Philadelphia 40.
Nichols Engineering & Research Corp., 60 Wall Tower, New York 5, N. Y.
Nichols Instruments Co., 1115 N. Hunter St., Baltimore 2, Md.
Nicholson & Co., W. H., 178 Oregon St., Wilkes-Barre, Pa.
Nikoh Tube Co., 5000 S. Whipple, Chicago 32. Ill.
Niles Rolling Mill Div., Sharon Steel Corp., Niles, O.
Nobel & Brienholt, 770 S. 2nd St., W., Salt Lake City, Utah.
Noera Mfg. Co., Div. Chase Brass & Copper Co., Waterbury 20, Conn.
Noma Lites, Inc., 55 W. 13th St., New York, N. Y.
Nooter Corp., 1400 S. Second St., St. Louis 4, Mo.
Norge Heat Div., Borg-Warner Corp., 346 E. South St., Kalamazoo, Mich.
Norgren Co., C. A., 3400 So. Elati St., Englewood, Colo.
Norma-Hoffmann Bearings Corp., Stamford, Conn.
Norman Products Co., Inc., 1150 Chesapeake Ave., Columbus, O.
Norris-Thermador Corp., 5215 S. Boyle Ave., Los Angeles 58, Calif.
Norristown Magnesia & Asbestos Co., Washington St., Norristown, Pa.
Norse Boiler Co., Inc., New Market, N. J.
North American Mfg. Co., 4455 E. 71st St., Cleveland 5, O.
North American Mogul Products Co., The, Standard Bldg., Cleveland 13, O.
North American Philips Co., Inc., 750 S. Fulton Ave., Mt. Vernon, N. Y.
North Penn Co., 38 E. 21st St., New York 10, N. Y.
Northern Blower Co., 6428 Barberton Ave., Cleveland 2, O.
Northern Indiana Brass Co., 935 Plum St., Elkhart, Ind.
Northwest Lead Co., 2700 16th Ave., S. W., Seattle 4, Wash.
Norton Co., 1 New Bond, Worcester 6, Mass.
Norwalk Valve Co., South Norwalk, Conn.
Norwood Associated Engineers Inc., 904 Columbus Ave., Springfield, Mass.
Novelty Steam Boiler Wks., Inc., Clare & Kolman Sts., Baltimore 30, Md.
Nutmeg Chemical Co., 134 Haven St., New Haven, Conn.
Nu-way Corp., The, 2416 4th Ave., Rock Island, Ill.
Nye Tool Co., 4120-30 Fullerton Ave., Chicago 39, Ill.

O

OPW Corp., 2735 Colerain Ave., Cincinnati 25, O.
Oakite Products, Inc., 19 Rector St., New York 6, N. Y.
Obear & Son, W. F., 6075 So. Normandie, Los Angeles 44, Calif.
Oberdorfer Foundries, Inc., 3007 Thompson Rd., Syracuse, N. Y.
O'Brien Corp., The, South Bend 21, Ind.
O'Brien Industries, P.O. Box 72, Caldwell, N. J.
O'Brien Steam Specialty Co., Inc., 712 State-Tower Bldg., Syracuse 2, N. Y.
Octagon Process, Inc., 15 Bank St., Staten Island 1, New York
Octagon Ventilator Co., 5828-30 S. Oakley Ave., Chicago 36, Ill.
Ohio Brass Co., 380 N. Main St., Mansfield, O.
Ohio Electric Mfg. Co., The, 5400 Dunham Rd., Maple Heights, O.
Ohio Foundry & Mfg. Co., Penn R. R. & Slack St., Steubenville, O.
Ohio Injector Co., 275 Main St., Wadsworth, O.
Ohio Pipe Bending & Machine Co., 3900-3910 Trent Ave., Cleveland 9, O.
Ohio Valley Hardware & Roofing Co., Evansville, Ind.
Ohmlac Paint & Refining Co., Inc., 24-13 Bridge Plaza North, Long Island City 1, N. Y.
Oil Equipment Mfg. Corp., 75 Brewster St., New Haven, Conn.
Okadee Co., 322 S. Michigan, Chicago, Ill.
Olin Mathieson Chemical Corp., Metals Div., East Alton, Ill.
Olsen Mfg. Co., C. A., Elyria, O.

Olsen Testing Machine Co., Tinius Easton Rd., Willow Grove, Pa.
Olson & Co., Arthur A., Broad St., Canfield, O.
Olympic Radio & Television, Inc., 34-01 38th Ave., Long Island City 1, N. Y.
Omega Machine Co., Div. of B-I-F Industries, Inc., 381 Harris Ave., Providence 1, R. I.
O'Neil-Irwin Mfg. Co., 541 Eighth, Lake City, Minn.
Orangeburg Mfg. Co., Orangeburg, N. Y.
Ormsby-Osterman, Inc., 3631 Cass Ave., St. Louis 13, Mo.
Orr & Sembower, Inc., Box 1138, Reading, Pa.
Osborn Mfg. Co., 5401 Hamilton Ave., Cleveland 14, O.
Oster Mfg. Co., 2057 E. 61st Pl., Cleveland 3, O.
Oster Mfg. Co., John, 5055 N. Lydell Ave., Milwaukee 17, Wis.
OverHead Heaters Inc., 1612 Book Bldg., Detroit 26, Mich.
Owens Co., H., 9300 Venice Blvd., Culver City, Calif.
Owens & Co., Inc., Henry, 51 Washington Ave., Cranston 7, R. I.
Owens-Corning Fiberglas Corp., 1911 Nicholas Bldg., Toledo 1, O.
Oxygen Equipment & Service Co., 8335 S. Halsted St., Chicago 20.
Ozalid Div. of General Aniline & Film Corp., 1505 Ansco Rd., Johnson City, N. Y.

P

P-K Industries, Inc., 27 Porete Ave., North Arlington, N. J.
Paasche Airbrush Co., 1909 Diversey Parkway, Chicago 14, Ill.
Pabco Products Inc., 475 Brannan St., San Francisco 19, Calif.
Pacific Fittings Div., General Metals Corp., Hollydale, Calif.
Pacific Lumber Co., The, 100 Bush St., San Francisco 4, Calif.
Pacific Machine & Iron Wks., Day Island Waterway, Tacoma, Wash.
Pacific Pumping Co., 9201 San Leandro Blvd., Oakland, Calif.
Pacific States Felt & Mfg. Co., Inc., 845 Howard St., San Francisco.
Pacific Steel Boiler Div., United States Radiator Corp., 439 Penobscot Bldg., Detroit 31, Mich.
Pacific Transducer Corp., 11836 W. Pico Blvd., Los Angeles 64, Calif.
Pacific Tube Co., 5710 Smithway St., Los Angeles 22, Calif.
Packard Electric Div., General Motors Corp., Warren, O.
Packless Metal Hose, Inc., 31-12 Winthrop Ave., New Rochelle, N. Y.
Paddock Engineering Co. of Texas, 2607 Cedar Springs, Dallas, Tex.
Page Steel & Wire, Div. of American Chain & Cable Co., Inc., Monessen, Pa.
Paine Co., 2 Westgate Rd., Addison, Ill.
Palcoseal Mfg. Co., Ltd., Massena, N. Y.
Paley Mfg. Corp., 244 Herkimer St., Brooklyn 16, N. Y.
Palladium Mastic Corp. of America, 327 Union Ave., Rutherford, N. J.
Palmer Electric Co., Inc., 230 E. Alexandrine, Detroit 1, Mich.
Palmer Mfg. Corp., 2200 W. Filmore St., Phoenix, Ariz.
Palmer Thermometers, Inc., 2501 Norwood Ave., Cincinnati (Norwood) 12, O.
Palnut Co., 106 Cordier St., Irvington, N. J.
Panelyte Div., St. Regis Paper Co., 230 Park Ave., New York 17.
Pangborn Corp., 400 Pangborn Blvd., Hagerstown, Md.
Pan-L-Heat Corp., 2838 N. E. Columbia Blvd., Portland 11, Ore.
Pantex Mfg. Corp., Hydraulics Div., Pawtucket, R. I.
Paragon Electric Co., 1609 Twelfth St., Two Rivers, Wis.
Paragon-Revolute Corp., 61 South Ave., Rochester 4, N. Y.
Parker Appliance Co., The, 17325 Euclid Ave., Cleveland 12, O.
Parker Boiler Mfg. Co., Sid E., 2035 E. 37th St., Los Angeles 58, Calif.
Parker-Kalon Div., General American Transportation Corp., 200 Varick St., New York 14, N. Y.
Parks-Cramer Co., P. O. Box 444, Fitchburg, Mass.
Patco Mfg. Co., 231 N. Bread St., Philadelphia, Pa.
Patrol Valve Co., The, 2310 E. Superior Ave., Cleveland 14, O.
Patterson-Ballagh Corp., 1900 E. 65th St., Los Angeles, Calif.
Patterson-Kelley Co., Inc., The, 730 Burson St., East Stroudsburg, Pa.
Paul-Lewis Laboratories, Inc., 4253 N. Port Washington Rd., Milwaukeee 12, Wis.
Paul Valve Corp., 683 Third Ave., New York 17, N. Y.
Payne Furnace Div., Affiliated Gas Equipment, Inc., 801 Royal Oaks Ave., Monrovia, Calif.
Peabody Engineering Corp., 580 Fifth Ave., New York 36, N. Y.
Pease Co., C. F., The, 2601 W. Irving Park Rd., Chicago 18, Ill.
Peck & Harvey Mfg. Corp., 5650 N. Western Ave., Chicago 45, Ill.
Peck, Stow & Wilcox Co., Center St., Southington, Conn.
Pecora Paint Co., Inc., 4th St., and Penna. R. R., Philadelphia 40, Pa.
Pedrick Tool & Machine Co., 3640 N. Lawrence St., Philadelphia 40, Pa.
Peer, Inc., 1440 Milton St., Benton Harbor, Mich.
Peerless of America, Inc., 5830 N. Pulaski Rd., Chicago 39, Ill.
Peerless Electric Co., 1401 W. Market St., Warren, O.
Peerless Heater Co., The, Div. of The Eastern Foundry Co., Boyertown, Pa.
Peerless Mfg. Corp., 14th & Ormsby, Louisville 10, Ky.
Peerless Pump Div., Food Machinery & Chemical Corp., 301 West Ave. 26, Los Angeles 31, Calif.
Penberthy Injector Co., Div. of Buffalo Eclipse Corp., 1242 Holden Ave., Detroit 3, Mich.
Penn Boiler & Burner Mfg. Corp., Lancaster, Pa.
Penn Brass & Copper Co., 3800 W. 20th St., Erie, Pa.
Penn Controls, Inc., P. O. Box 556, Goshen, Ind.
Penn Galvanizing Co., 2201 E. Tioga St., Philadelphia 34, Pa.
Penn Industrial Instrument Corp., 4110 Haverford Ave., Philadelphia 4, Pa.
Penn Mfg. Corp. of Washington, Pa., 380 W. Chestnut St., P. O. Box 484, Washington, Pa.
Penn Ventilator Co., 3252 Goodman, Philadelphia 40, Pa.
Pennant Corp., 200 Grant St., S. W., Grand Rapids 4, Mich.
Pennsylvania Engineering Wks., 526 S. Jefferson St., New Castle, Pa.
Pennsylvania Flexible Metallic Tubing Co., 72nd St. & Powers Lane, Philadelphia 42, Pa.
Pennsylvania Forge Co., Milnor & Bleigh Sts., Philadelphia, Pa.
Pennsylvania Furnace & Iron Co., Warren, Pa.
Pennsylvania Pump & Compressor Co., Easton, Pa.
Pennsylvania Salt Mfg. Co., 869 Widener Bldg., Philadelphia 7, Pa.
Perfect Circle Corp., Hagerstown, Ind.
Perfecting Service Co., 332 Atlando Ave., Charlotte, N. C.
Perfection Grate & Stoker Co., 4 Fisk Ave., Springfield 7, Mass.
Perfection Refrigeration Parts Co., Harvey, Ill.
Perfection Stove Co., 7609 Platt Ave., Cleveland 4, O.
Perfex Corp., 500 W. Oklahoma Ave., Milwaukee 7, Wis.
Perkins Machine Co., 4 Perkins Ave., Warren, Mass.
Perkins & Son, Inc., B. F., Chicopee St., Holyoke, Mass.
Permacrete Products, 1839 South Wall, Columbus, O.
Permatex Co., Inc., P. O. Box 1, Brooklyn 35, N. Y.
Permutit Co., 330 W. 42nd St., New York 36, N. Y.
Perolin Co., Inc., The, 1112 W. 37th St., Chicago 9, Ill.
Perry Co., P. O. Box 2057, Waco, Texas
Peters-Dalton, Inc., 17900 Ryan Rd., Detroit 12, Mich.
Peterson Co., B. A., 300 W. R. R. Ave., Dowagiac, Mich.
Petro, 3170 W. 106th St., Cleveland 11, O.
Petroleum Solvents Corp., 331 Madison Ave., New York 17, N. Y.
Pfening Co., Fred D., The, 1075 W. 5th Ave., Columbus 8, O.
Phelps Dodge Copper Products Corp., British American Tube Div., 40 Wall St., New York 5, N. Y.
Phelps Mfg. Co., 715 Thomas St., Little Rock, Ark.
Pheoll Mfg. Co., 5700 Roosevelt Rd., Chicago 50, Ill.
Philadelphia Gear Works, Inc., Erie Ave. & G St., Philadelphia 34, Pa.
Philadelphia Pipe Bending Co., 4135-65 N. Fifth St., Philadelphia 40.
Philadelphia Pump and Machinery Co., Inc., 1513 Race St., Philadelphia, Pa.
Philadelphia Thermometer Co., 6th & Cayuga St., Philadelphia 40, Pa.
Philco Corp., Tioga & C Sts., Philadelphia 34, Pa.
Phillips & Co., H. A., 3255 W. Carroll Ave., Chicago 24, Ill.
Phillips Cooling Tower Co., Inc., 220 Dupont St., Brooklyn 22, N. Y.
Phillips Drill Co., U. S. No. 12 & Liberty Trail, Michigan City, Ind.
Phoenix Brass Fittings Corp., 354-378 Coit St., Irvington 11, N. J.
Phoenix Mfg. Co., Joliet, Ill.
Phoenix Products Co., 4715 N. 27th St., Milwaukee 16, Wis.
Phoenix Ventilator Co., Inc., 1665 63rd St., Brooklyn, N. Y.
Photoswitch, Inc., 77 Broadway, Cambridge 42, Mass.
Photovolt Corp., 95 Madison Ave., New York 16, N. Y.
Pick Mfg. Co., West Bend, Wis.
Pierce Co., Wm. B., The, 277 Military Rd., Buffalo 7, N. Y.
Piezo Mfg. Corp., 110 E. 42nd St., New York 17, N. Y.
Pilley Brush Co., Fort Madison, Ia.
Pines Engineering Co., Inc., 685 Walnut St., Aurora, Ill.
Pioneer Pump Div., Detroit Harvester Co., 14300 Tireman Ave., Detroit 28, Mich.
Pioneer Roofing & Sheet Metal Co., 226 N. Main St., Muskogee, Okla.
Pioneer Tool Co., 908 10th St., Racine, Wis.
Pipe Line Development Co., 5700 Detroit Ave., Cleveland 2, O.
Piping Specialties, Inc., 114 Liberty St., New York 6, N. Y.
Pittsburgh Brass Mfg. Co., 3155 Penn Ave., Pittsburgh 1, Pa.
Pittsburgh Chemical Laboratories, Inc., 715 Penn Ave., Pittsburgh.
Pittsburgh Corning Corp., 1 Gateway Center, Pittsburgh 22, Pa.
Pittsburgh Lectrodryer Corp., 327 32nd St., Pittsburgh 30, Pa.
Pittsburgh Nipple Wks., Inc., 1455 Spring Garden Ave., Pittsburgh 12, Pa.
Pittsburgh Pipe Coil & Bending Co., 61 Bridge St., Etna Pittsburgh 23, Pa.
Pittsburgh Piping & Equipment Co., 10 43rd St., Pittsburgh 1, Pa.
Pittsburgh Plate Glass Co., 1 Gateway Center, Pittsburgh 22, Pa.
Pittsburgh Steel Co., 800 Grant Bldg., Pittsburgh, Pa.
Pittsburgh Tube Co., 212 Wood St., Pittsburgh 22, Pa.
Pittsburgh Valve Co., Reedsville, W. Va.
Pittsburgh Valve & Fittings Corp., Barberton, O.
Pittsburgh Water Heater Co., Box 4452, Pittsburgh 5, Pa.
Pittsfield Products, Inc., 2275 Platt Rd., Ann Arbor, Mich.
Plasteel Products Corp., McAdam Ave., Washington, Pa.
Plastergon Wall Board Co., Philadelphia Ave., Buffalo 7, N. Y.
Plastex Corp., 402 Mt. Vernon Ave., Columbus 3, Ohio.
Plastic Products Co., 6467 Georgia Ave., Detroit 11, Mich.
Plastipipe, Inc., 5544 W. 104th St., Inglewood, Calif.
Pleasantaire Corp., 734 15th St., Washington 5, D. C.
Plibrico Co., 1800 Kingsbury St., Chicago 14, Ill.
Plumb Mfg. Co., 1925 Dwyer Ave., Utica 3, N. Y.
Plummer Spray Equipment Co., 700 Filmore St., Napoleon, O.
Plymouth Industrial Products, Inc., P. O. Box 27, Plymouth, Wis.
Poe Co., C. W., The 10526 Wilbur Ave., Cleveland 6, O.
Pokorney Mfg. Co., 3117 Clybourn Ave., Chicago, Ill.
Polaire Cooler Co., Inc., 112 South 8th Ave., P. O. Box 6373, Phoenix, Ariz.
Polis Mfg. Co., J. D., 2900-2920 W. 26th St., Chicago 23, Ill.
Polyken Products, Dept. of the Kendall Co., 222 W. Adams St., Chicago 6, Ill.
Poole Foundry & Machine Co., 1700 Union Ave., Woodberry, Baltimore 11, Md.
Porce-Lin Tank Lining Co., 456 Milwaukee, Detroit, Mich.
Porous Plastic Filter Co., Glen Cove, N. Y.
Portable Electric Tools, Inc., 320 W. 83rd St., Chicago 20, Ill.
Porter & Co., Inc., H. W., 825 Frelinghuysen Ave., Newark 5, N. J.
Porter-Cable Machine Co., Syracuse 8, N. Y.
Portmar Boiler Co., Inc., 193 Seventh St., Brooklyn 15, N. Y.
Positive Control Co., The, 2818 Spring Grove Ave., Cincinnati 25, O.
Potter & Brumfield Sales Co., Princeton, Ind.
Potts Co., Horace T., Erie Ave. & "D" St., Philadelphia 34, Pa.
Potts-Farrington Co., 4250 Wissahickon Ave., Philadelphia 29, Pa.
Powder Power Tool Corp., 7526 S. W. Macadam Ave., Portland 1, Ore.
Powder Weld Process Co., The, 419 Kent Ave., Brooklyn, N. Y.

Powell Co., Wm., The, 2525 Spring Grove Ave., Cincinnati 22, O.
Power Engineering Co., 205 West Wacker Dr., Chicago 6, Ill.
Powers Regulator Co., 3400 Oakton St., Skokie, Ill.
Prat-Daniel Corp., 2 Meadow St., South Norwalk, Conn.
Precision Chemical Pump Corp., 1396 Main St., Waltham 54, Mass.
Precision Products, Inc., 530 S. Quaker, Tulsa 10, Okla.
Precision Thermometer & Instrument Co., 1506 Brandywine St., Philadelphia 30, Pa.
Precision Welder Mfg. Co., 660 W. Grand Ave., Chicago, Ill.
Preferred Utilities Mfg. Corp., 1860 Broadway, New York 23, N. Y.
Prepo Corp., Edgerton, Wis.
Presstite Engineering Co., 3900 Chouteau Ave., St. Louis 10, Mo.
Primor Products, Inc., 2011 W. Beecher Rd., Adrian, Mich.
Pritchard & Co. of California, J. F., 4625 Roanoke Parkway, Kansas City 12, Mo.
Proctor & Schwartz, Inc., 7th St. and Tabor Rd., Philadelphia 20, Pa.
Producers & Distributors, Inc., 714 S. 6th St., Allentown, Pa.
Products Planning Co., Grant Bldg., Pittsburgh 19, Pa.
Products Research Co., 3126 Los Feliz Blvd., Los Angeles 39, Calif.
Propellair Div., Robbins & Myers Inc., 1345 Lagonda Ave., Springfield, O.
Proportioneers, Inc., Div. of B-I-F Industries, Inc., Providence, R. I.
Protective Closures Co., 2207 Elmwood Ave., Buffalo 22, N. Y.
Prox Co., Inc., Frank, 1201 S. First St., Terre Haute, Ind.
Puhl & Hepper Mfg. Co., Inc., 6400 W. Florissant Ave., St. Louis 20.
Pullman Vacuum Cleaner Co., 31-39 Allerton St., Boston 19, Mass.
Pumpenbay Brugg K. Rutschi, Brugg, Switzerland
Punch-Lok Co., 321 N. Justine St., Chicago 7, Ill.
Pur Air Div., Barnebey-Cheney Co., N. Cassady at 8th, Columbus 19, O.
Pure Carbonic Co., Div. of Air Reduction Co., Inc., 60 E. 42nd St., New York 17, N. Y.
Purolator Products, Inc., 970 New Brunswick Ave., Rahway, N. J.
Pyle-National Co., The, 1373 N. Kostner Ave., Chicago 51, Ill.
Pyott Foundry & Machine Co., 328 N. Sangamon St., Chicago 7, Ill.
Pypon Co., 410 Frick Bldg., Pittsburgh 19, Pa.
Pyrolite Products Co., 1221-1231 W. 74th St., Cleveland 2, O.
Pyrometer Instrument Co., Inc., The, Bergenfield, N. J.

Q

Q-P Mfg. Co., Needham Heights, Mass.
Quaid Fabrications, Inc., 157-167 W. Oxford St., Philadelphia 22, Pa.
Quaker City Iron Wks., Allegheny & Tulip St., Philadelphia 34, Pa.
Quaker Rubber Corp., Div. H. K. Porter Co., Inc., Comly & Milnor Sts., Philadelphia 24, Pa.
Quality Specialty Co., Inc., 28th & Lincoln Ave., Camden 5, N. J.
Quickdraft Co., Div. of Hall Safe Co., Inc., 1642 Cleveland Ave., N. W., Canton, O.
Quickwork Div., Whiting Corp., Harvey, Ill.
Quiet Automatic Oil Burner Corp., 33 Bloomfield Ave., Newark 4, N. J.
Quiet-Heet Mfg. Corp., 46 Oliver St., Newark 5, N. J.
Quigley Co., Inc., 527 Fifth Ave., New York 17, N. Y.
Quik Joint Div., Automatic Bending Co., 469 E. 159th St., Harvey, Ill.

R

R C S Tool Sales Corp., P. O. Box 1434, Joliet, Ill.
R-P & C Valve Div., American Chain & Cable Co., Inc., Reading, Pa.
Radex Corp., 2076 N. Elston Ave., Chicago 14, Ill.
Radiant Baseboard Panels, Inc., 900 W. Main St., New Britain, Conn.
Radiant Combustion System, Inc., 342 Madison Ave., New York 17, N. Y.
Radiant Devices, 4030 Chouteau Ave., St. Louis, Mo.
Radiant Panel Mfg. Co., 9 E. Pearl St., Torrington, Conn.
Radiant-Ray Radiation, Inc., Newington, Conn.
Radiant Utilities Corp., 8817-18th Ave., Brooklyn 14, N. Y.
Radiator Specialty Co., 1700-1900 Dowd Rd., Charlotte 1, N. C.
Radiator Valve Co. of America, 428 S. 52nd St., Philadelphia 43, Pa.
Radio Corp. of America, RCA Victor Div., Front & Cooper, Camden, N. J.
Radio Corp. of America, Engineering Products Dept., Camden, N. J.
Radioactive Products, Inc., 540 W. Congress St., Detroit 26, Mich.
Raisler Corp., Grimes Sprinkler Div., 129 Amsterdam Ave., New York 23, N. Y.
Ramset Div., Olin Mathieson Chemical Corp., 12117 Berea Rd., Cleveland 11, O.
Ramsey Chain Co., Inc., 1029 Broadway, Albany 1, N. Y.
Ramtite Co., The, 2563 W. 18th St., Chicago 8, Ill.
Randall Graphite Bearings, Inc., Greenlawn & Lake Sts., Lima, O.
Randolph-Page, Inc., 175 Fifth Ave., New York 10, N. Y.
Ravena Iron Co., Ravena, N. Y.
Rawplug Co., Inc., The, 271 Church St., New York 13, N. Y.
Ray Oil Burner Co., 1301 San Jose Ave., San Francisco 12, Calif.
Raybestos-Manhattan, Inc., 61 Willett St., Passaic, N. J.
Rayfield Co., C. L., 2010-18 S. Halsted St., Chicago 8, Ill.
Rayfield-Staffco Burner Co., 2066 Canalport, Chicago 8, Ill.
Raymond Div., Combustion Engineering, Inc., 1324 N. Branch St., Chicago, Ill.
Read Standard Corp., Blower-Stoker Div., York, Pa.
Reading Tube Corp., 350 - 5th Ave., New York, N. Y.
Ready-Power Co., The, 11231 Freud Ave., Detroit 14, Mich.
Reco Products Div., Recony Corp., 150 Nassau St., New York 38, New York.
Rector Mineral Trading Corp., 551 Fifth Ave., New York 17, N. Y.
Red Jacket Co., Inc., 510 Investment Bldg., Pittsburgh, Pa.
Red Spot Electric Co., 7405 S. Tacoma Way, Tacoma 9, Wash.
Redmond Co., Inc., Owosso, Mich.
Ree Associates, Bogota, N. J.
Reed Mfg. Co., 1425 W. 8th St., Erie, Pa.
Reed Unit-Fans, Inc., 1001 St. Charles Ave., New Orleans 8, La.
Reeves Pully Co., Columbus, Ind.
Reflectal Corp. Subsid., Borg-Warner Corp., 310 S. Michigan Ave., Chicago 4, Ill.
Reflin Co., 16825 South Broadway, P. O. Box 452, Gardena, Calif.
Refractory & Insulation Corp., 120 Wall St., New York 5, N. Y.
Refrigeration Appliances, Inc., 917-923 W. Lake St., Chicago, Ill.
Refrigeration Devices Co., 51 E. Centre St., Nutley 10, N. J.
Refrigeration Economics Co., Inc., 1231 Tuscarawas E., Canton 2, O.
Refrigeration Engineering Inc., 7250 E. Slauson Ave., Los Angeles 22.
Rega Mfg. Co., 79 Mt. Hope Ave., Rochester 20, N. Y.
Register & Grille Mfg. Co., Inc., 70 Berry St., Brooklyn 11, N. Y.
Reichert Float & Mfg. Co., 2242 Smead Ave., Toledo 6, O.
Reif-Rexoil, Inc., 37-41 Carroll St., Buffalo 3, N. Y.
Reilly Tar & Chemical Corp., 1615 Merchants Bank Bldg., Indianapolis 4, Ind.
Reiner & Campbell Co., Inc., 19 Euclid Ave., P. O. Box 5035, Newark 5, N. J.
Reintjes Co., Geo. P., 2517-19 Jefferson St., Kansas City, Mo.
Reliable Metal Engineering Co., 4336-4358 S. Knox, Chicago, Ill.
Reliable Perforating Co., 2047 N. Wood St., Chicago, Ill.
Reliable Products Mfg. Co., 123 De Kalb Ave., Brooklyn, N. Y.
Reliance Automatic Lighting Co., 1929 Mead St., Racine, Wis.
Reliance Electric & Engineering Co., 1058 Ivanhoe Rd., Cleveland 10.
Reliance Gauge Column Co., 5902 Carnegie Ave., Cleveland 3, O.
Reliance Refrigerating Machine Co., 3401 N. Kedzie Ave., Chicago.
Remco, Inc., Zelienople, Pa.
Remington Air Conditioning Div., Remington Corp., Auburn, N. Y.
Remington Arms Co., Inc., Bridgeport, Conn.
Rempe Co., 342 N. Sacramento Blvd., Chicago 12, Ill.
Rensselaer Valve Co., Ontario St., Cohoes, N. Y.
Reps Tool Co., Inc., Box 5, Elmwood Branch, Hartford 10, Conn.
Republic Boiler Corp., 50 W. 50th St., New York, N. Y.
Republic Flow Meters Co., 2240 Diversey Pkwy., Chicago 47, Ill.
Republic Products Co., 7420 State Rd., Philadelphia 36, Pa.
Republic Rubber Div., Lee Rubber & Tire Corp., Youngstown 1, O.
Republic Steel Corp., Republic Bldg., Cleveland 1, O.
Republic Steel Corp., Bolt & Nut Div., 1970 Carter Rd., Cleveland 13.
Republic Steel Corp., Steel & Tubes Div., 224 E. 131st St., Cleveland 8, O.
Research Corp., Chrysler Bldg., New York 17, N. Y.
Research Products Corp., 1015 E. Washington Ave., Madison 10, Wis.
Research Vacuum Supply Co., 6712 N. Clark St., Chicago 18, Ill.
Resisto Pipe & Valve Co., 262 Bridge St., East Cambridge, Mass.
Resistoflex Corp., Belleville 9, N. J.
Reuland Electric Co., 3001 W. Mission Rd., Alhambra, Calif.
Revcor, Carpentersville, Ill.
Revere Copper & Brass, Inc., 230 Park Ave., New York 17, N. Y.
Rex Clay Products Co., 14414 Dexter Blvd., Detroit, Mich.
Rex Welder & Engineering Co., 409 Southwest Blvd., Kansas City 8, Mo.
Reynolds Electric Co., 3000 River Rd., River Grove, Ill.
Reynolds Mfg. Co., The, Box 333, Comstock Park, Mich.
Reynolds Mfg. Co., Inc., Springfield, Mo.
Reynolds Metals Co., 2500 S. Third St., Louisville 1, Ky.
Reynolds Shaffer Co., 12100 Cloverdale Ave., Detroit 4, Mich.
Reznor Mfg. Co., Mercer 8, Pa.
Rheem Mfg. Co., 7600 Kedzie Ave., Chicago, Ill.
Rhoads & Sons, J. E., 35 N. Sixth St., Philadelphia 6, Pa.
Rhode Island Fittings Co., 355 Dexter St., Providence 7, R. I.
Rhode Island Humidifier & Ventilating Co., 99 Chauncy St., Boston 11, Mass.
Rhodes, Inc., M. H., 30 Bartholomew Ave., Hartford, Conn.
Rich Fan Mfg. Co., Inc., Phil, 2900 Caroline St., Houston 4, Tex.
Richland Co., 100 W. 4th St., Mansfield, O.
Richmond Engineering Co., Inc., 7th and Hospital Sts., Richmond, Va.
Richmond Radiator Co., Box 111, Metuchen, N. J.
Richmont, Inc., 922 S. Myrtle Ave., Monrovia, Calif.
Ric-wiL Co., The, Barberton, O.
Ridge Tool Co., Clark St., Elyria, O.
Rid-Sludge Div., Aulwood Mfg. Co., 77 Raymond Ave., St. Paul, Minn.
Riggin Metal Products, Inc., Box 267, Kankakee, Ill.
Rigidbilt Inc., 2850 W. Fulton St., Chicago 12, Ill.
Rigidized Metals Corp., 721 Ohio St., Buffalo 3, N. Y.
Riley Stoker Corp., 9 Neponset St., Worcester, Mass.
Rinehart Inc., 511-513 Main St., Richmond, Ind.
Ripley Co., Inc., Middletown, Conn.
Ripley Co., Inc., L-R Blower Div., Middletown, Conn.
Risdon Mfg. Co., The, John M. Russell Div., Andrew Ave., Box 520, Naugatuck, Conn.
Rite Engineering & Mfg. Corp., 144 S. Mission Rd., Los Angeles, Calif.
Ritter Pattern & Casting Co., Inc., 120 Walker St., New York 13, N. Y.
Rittling Corp., The, Rand Bldg., Buffalo 3, N. Y.
Riverside Boiler & Engineering Co., Inc., 4725 N. E. 28th, P. O. Box 7141, Ft. Worth, Tex.
Robbins & Myers, Inc., 1345 Lagonda Ave., Springfield, O.
Robbins & Myers, Inc., Fan Div., 387 S. Front St., Memphis, Tenn.
Roberson Co., L. N., 1539 E. 103rd St., Seattle 55, Wash.
Robert Mfg. Co., 9035 Venice Blvd., Los Angeles 34, Calif.
Roberts-Gordon Appliance Corp., 44 Central Ave., Buffalo 6, N. Y.
Roberts Tube Works, 2500 Military Ave., Detroit 9, Mich.
Robertson Co., H. H., 2400 Farmers Bank Bldg., Pittsburgh 22, Pa.
Robinson Aviation, Inc., Teterboro Air Terminal, Teterboro, N. J.
Robinson Clay Product Co., The, 65 W. State St., Akron 9, O.
Robinson Corp., 120 Valley Rd., Roselle Park, N. J.

Robinson Industries, Coleman, Mich.
Robinson Ventilating Co., Zelionople, Pa.
Robvon Backing Ring Co., 675 Garden St., Elizabeth 2, N. J.
Rochester Lead Works, Inc., 380 Exchange St., Rochester 8, N. Y.
Rochester Mfg. Co., Inc., 63 Rockwood St., Rochester 10, N. Y.
Rochester Products, Div. of General Motors Corp., Rochester, N. Y.
Rock Island Register Co., 2435 Fifth Ave., Rock Island, Ill.
Rockford Screw Products Co., 2501 Ninth St., Rockford, Ill.
Rockwell Co., W. S., 2543 Eliot St., Fairfield, Conn.
Rockwell Mfg. Co., Meter & Valve Div., 400 N. Lexington Ave., Pittsburgh 8, Pa.
Rockwood Sprinkler Co., 38 Harlow St., Worcester 5, Mass.
Roddick Tool Co., P. O. Box 109, Anaheim, Calif.
Roessing Mfg. Co., 1616 Noble St., Sharpsburg, Pittsburgh 15, Pa.
Roller Bearing Co. of America, Sullivan Way, West Trenton, N. J.
Rome-Turney Radiator Co., Canal St., Rome, N. Y.
Ronor Corp., 1360 W. 9th St., Cleveland 13, O.
Roots-Connersville Blower Div., 900 W. Mount St., Connersville, Ind.
Roper Corp., Geo. D., Blackhawk Park Ave., Rockford, Ill.
Rosebraugh Co., W. W., 680 S. 17th St., Salem, Ore.
Rosedale Foundry & Machine Co., Columbus & Preble Aves., N. S., Pittsburgh, Pa.
Ross Engineering Corp., J. O., 444 Madison Ave., New York 22, N. Y.
Ross Sprinkler Co., 4333 Temple City Blvd., Rosemead, Calif.
Ross Valve Mfg. Co., Inc., 6 Oakwood Ave., Troy, N. Y.
Rotary Concrete Drill Co., 650 S. Arroyo Pkwy., Pasadena, Calif.
Rotary Seal Co., 2020 N. Larrabee St., Chicago 14, Ill.
Roth Co., Roy E., 2420-A 24th Ave., Rock Island, Ill.
Rotometals, 980 Harrison St., San Francisco 7, Calif.
Rotor Tool Co., 26300 Lakeland Blvd., Cleveland 23, O.
Royal Jet, Inc., 1024 Westminster Ave., Alhambra, Calif.
Royal Mfg. Corp., Waterloo, Ind.
Royalton Co., Inc., Gasport, N. Y.
Royersford Foundry & Machine Co., Inc., 101-131 Main St., Royersford, Pa.
Roylyn, Inc., 1706 Standard Ave., Glendale 1, Calif.
Rubatex Div., Great American Industries, Inc., Bedford, Va.
Rubber & Asbestos Corp., 225 Belleville Ave., Bloomfield, N. J.
Rubber & Plastics Compound Co., Rockefeller Plaza, New York, N. Y.
Ruberoid Co., 500 Fifth Ave., New York 18, N. Y.
Ruby Chemical Co., 74 McDowell St., Columbus 8, O.
Ruemelin Mfg. Co., 3860 N. Palmer St., Milwaukee 12, Wis.
Ruggles-Klingemann Mfg. Co., 110 Tremont St., Boston, Mass.
Ruppright's Rotary Roof Cooler, Box 6795, Los Angeles 22, Calif.
Russell, Burdsall & Ward Bolt & Nut Co., Port Chester, N. Y.
Russell Co., F. C., The, 1100 Chester Ave., Clevelend 1, O.
Rust-Oleum Corp., 2425 Oakton St., Evanston, Ill.
Rutland Fire Clay Co., Curtis Ave., Rutland, Vt.
Ruud Mfg. Co., 2934 Smallman St., Pittsburgh 1, Pa.

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SKF Industries, Inc., Front St., & Erie Ave., Philadelphia 32, Pa.
S.O.S. Products Co., Inc., 282 Nassau Ave., Brooklyn 22, N. Y.
Sac Tool Mfg. Co., 1913 Washington Ave., St. Louis 3, Mo.
St. Clair Rubber Co., 440 E. Jefferson, Detroit, Mich.
St. Louis Blow Pipe & Heater Co., Div. of Young Sales Corp., 1948 N. 9th St., St. Louis 6.
St. Louis Tool Co., 6100 Prescott St., St. Louis 15, Mo.
St. Paul Corrugating Co., S. Wabasha and Water Sts., St. Paul 1.
Sales & Co., Murray W., 801 W. Baltimore Ave., Detroit 2, Mich.
Salina Metal Products Co., 9th and Bishop, Salina, Kan.
Sall Bros. Co., 2320 Kishwaukee St., Rockford, Ill.
Sall Mountain Co., Box 777, Hamilton, O.
Salsbury Corp., 1161 E. Florence Ave., Los Angeles 1, Calif.
Sampson Chemical & Pigment Corp., 2830 W. Lake St., Chicago 12, Ill.
San Angelo Foundry & Machine Co., P. O. Box 1152, San Angelo, Tex.
Sandee Mfg. Co., 5050 W. Foster Ave., Chicago, Ill.
Sangamo Electric Co., 1301 N. 11th St., Springfield, Ill.
Santa Fe Tank & Tower Co., Inc., 5401 S. Boyle Ave., Los Angeles 11.
Santa Fe Tank & Tower Co. of Texas, P. O. Box 278, Garland, Tex.
Saran Lined Pipe Co., 2415 Burdette Ave., Ferndale 20, Mich.
Sarco Co., Inc., Empire State Bldg., New York 1, N. Y.
Sarcotherm Controls, Inc., Empire State Bldg., New York 1, N. Y.
Sargent Enginairing Co., 1375 E. 45th St., Cleveland 3, O.
Sauereisen Cements Co., 2308 Main St., Pittsburgh, Pa.
Saunders Mfg. Co., 25 Atherton St., Yonkers, N. Y.
Saverite Engineering Co., 158 - 14th St., Hoboken, N. J.
Sawhill Tubular Products, Inc., P. O. Box 546, Sharon, Pa.
Scaico, Inc., Market St., Palmyra, N. J.
Scaife Co., 26 Ann St., Oakmont, Pa.
Schade Valve Mfg. Co., 2527 N. Bodine St., Philadelphia 33, Pa.
Schaible Co., The, 1086 Summer St., Cincinnati 4, O.
Schatz Mfg. Co., The, Fairview, Poughkeepsie, N. Y.
Schaub Engineering Co., Fred H., 2110 S. Marshall Blvd., Chicago 23.
Schaul Mfg. Co., 1794 E. 55th St., Cleveland 30, O.
Schecter Brothers Co., Hancock and Huntingdon Sts., Philadelphia 33.
Schemenauer Mfg. Corp., Holland, O.
Schieren Co., Chas. A., 30-38 Ferry St., New York 38, N. Y.
Schild Mfg. Co., Lakewood Station, Box 9803, Dallas 2, Tex.
Schmieg Industries, Inc., P. O. Box 4701, Detroit 34, Mich.
Schnacke, Inc., 1101 N. Governor St., Evansville, Ind.
Schneible Co., Claude B., P. O. Box 81, No. End Station, Detroit 2.
Schoedinger, Inc., F. O., 322-358 Mt. Vernon Ave., Columbus 16, O.
Schramm, Inc., West Chester, Pa.
Schror, Dr. Adolph, 52 Cambridge St., East Orange, N. J.
Schundler & Co., Inc., F. E., 29-28 41st Ave., Long Island City, N. Y.
Schurs Oil Burner Co., 8500 Zamore Ave., Los Angeles 1, Calif.
Schutte and Koerting Co., Cornwells Heights, Bucks County, Pa.
Schwitzer-Cummins Co., 1125 Massachusetts Ave., Indianapolis 7, Ind.
Sciaky Bros. Inc., 4915 W. 67th St., Chicago 38, Ill.
Scientific Instrument Co., 1041 Second Ave., Detroit 26, Mich.
Scott Valve Mfg. Co., 3963 McKinley Ave., Detroit 8, Mich.
Scovill Mfg. Co., Waterville Div., Waterville 14, Conn.
Screw Machine Products Co., P. O. Box 7497, Portland 20, Ore.
Scully Signal Co., 174 Green St., Melrose 76, Mass.
Sealed Power Corp., 2001 Sanford St., Muskegon 61, Mich.
Sealed Unit Parts Co., Inc., 261 E. 161st St., Bronx 51, N. Y.
Sealol Corp., 45 Willard Ave., Providence 5, R. I.
Seamless Rubber Co., The, F.O.S. Industrial Tape Div., 464 Congress Ave., New Haven 3, Conn.
Seamlex Co., Inc., 41-23 24th St., Long Island City 1, N. Y.
Selas Corp. of America, Erie Ave. and D St., Philadelphia 34, Pa.
SelecTemp Div., Iron Fireman Mfg. Co., 3170 W. 106th St., Cleveland 11, O.
Self Cleaning Strainer Co., 5611 S. Ashland Ave., Chicago, Ill.
Sellers Engineering Co., 4874-76 N. Clark St., Chicago 40, Ill.
Semet-Solvay Engineering Div., Allied Chemical & Dye Corp., 40 Rector St., New York 6, N. Y.
Servel, Inc., 119 Morton Ave., Evansville 20, Ind.
Service To Industry, Box 133, West Hartford, Conn.
Seton Name Plate Co., 394-B Central Ave., New Haven 15, Conn.
Shafer Bearing, Div. of Chain Belt Co., 801 Burlington Ave., Downers Grove, Ill.
Shakeproof Div., Illinois Tool Wks., St. Charles Rd., Elgin, Ill.
Shallcross Co., 48th and Grays Ferry Rd., Philadelphia 43, Pa.
Shallcross Controls, Inc., 2217-21 N. 31st St., Milwaukee 8, Wis.
Shank Co., Cyrus, 4646 W. 12th Pl., Chicago 50, Ill.
Sharon Steel Corp., Sharon, Pa.
Shaw Co., Benjamin F., Second & Lombard Sts., Wilmington 99, Del.
Shaw-Kendall Engineering Co., 128 S. Superior St., Toledo 4, O.
Shaw-Perkins Mfg. Co., 201 E. Carson St., Pittsburgh 19, Pa.
Sheffler-Gross Co., Drexel Bldg., Philadelphia 6, Pa.
Sheldon Equipment Co., E. H., 716 Nims St., Muskegon, Mich.
Shell Oil Co., Lubricants Dept., 50 W. 40th St., New York 20, N. Y.
Shephard Heater Co., Inc., 951 Sycamore St., Terre Haute, Ind.
Sherwin-Williams Co., The, 101 Prospect Ave., N. W., Cleveland, O.
Sherwood Water Treatment Co., Inc., Beverly, N. J.
Siemon Mfg. Co., 1817-19 Holmes St., Kansas City 8, Mo.
Sier Bath Gear & Pump Co., Inc., North Bergen, N. J.
Sight Feed Generator Co., P. O. Box 38, West Alexandria, O.
Signal Electric Div. of King-Seeley Corp., Menominee, Mich.
Signal Indicator Co., 42 Stewart Ave., Brooklyn 37, N. Y.
Sikes Co., S. R., 1028 S. Third St., Minneapolis 15, Minn.
Silco Products, Inc., 1330 Quincy St., N.E., Minneapolis, Minn.
Silent Glow Oil Burner Co., 850 Windsor St., Hartford, Conn.
Silvercote Products, Inc., 161 E. Erie St., Chicago 11, Ill.
Simplaire, 521 Fifth Ave., New York 17, N. Y.
Simplex Ceiling Corp., 552 W. 52nd St., New York 19, N. Y.
Simplex Heating Specialty Co., Inc., 954 Cabell St., Lynchburg, Va.
Simplex Mfg. Co., 198 N. Main St., Fond du Lac, Wis.
Simplex Oil Heating Corp., 7901 Oxford, Philadelphia 11, Pa.
Simplex Valve & Meter Co., 68th and Upland Sts., Philadelphia 42, Pa.
Sims Co., 18th & Whitley Sts., Erie, Pa.
Sims Pump Valve Co., 1314 Park Ave., Hoboken, N. J.
Sinclair-Collins Valve Co., 454 Morgan Ave., Akron, O.
Sioux Steel Co., P. O. Box 898, Sioux Falls, S. D.
Sipe & Co., James B., Box 8010, Pittsburgh 16, Pa.
Skidmore Corp., St. Joseph, Mich.
Skilbeck Mfg. Co., 7432 27th Ave., Kenosha, Wis.
Skil Corp., 5033 Elston Ave., Chicago 30, Ill.
Skinner Co., M. B., 3502 W. Sample, South Bend 21, Ind.
Skinner Electric Valve Div., The Skinner Chuck Co., Edgewood Ave., New Britain, Conn.
Skinner Engine Co., 337 W. 12th St., Erie, Pa.
Skinner Irrigation Co., 121 E. Canal St., Troy, O.
Skyline Industries, Titusville, Pa.
Slant-Fin Radiator Corp., 5113-17 2nd Ave., Brooklyn, N. Y.
Sly Mfg. Co., W. W., 4700 Train Ave., Cleveland 2, O.
Small Motors, Inc., 2076 Elston Ave., Chicago 14, Ill.
Smith Bros. Co., 414 S. Harvey, Oak Park, Ill.
Smith Co., Inc., H. B., The, 64 Main St., Westfield, Mass.
Smith Co., J. B., 3327 B St., Philadelphia 34, Pa.
Smith Co., S. Morgan, Lincoln & Hartley Sts., York, Pa.
Smith Control & Instrument Corp., Palmyra, N. J.
Smith Corp., A. O., 3533 N. 27th St., Milwaukee 1, Wis.
Smith Corp., A. O., Eastern Motor Div., 1000 Webster St., Dayton 4, O.
Smith Filter Corp., 1603-2 Ave., Moline, Ill.
Smith & Kanzler Corp., E. Linden Ave., Linden, N. J.
Smith Products Co., 43642 Nine Mile Rd., Northville 1, Mich.
Smith-Raymond Co., 1231-33 Tenth Ave., Columbus, Ga.
Smith & Serrell, Inc., 200 Washington St., Newark 2, N. J.
Smith Twin Tubular Boiler Co., Inc., Cottman St., at State Rd., Philadelphia 35, Pa.
Smith Welding Equipment Corp., 2633 S. E. Fourth St., Minneapolis 14, Minn.
Smolensky Valve Co., Inc., 940 Broadway, Bedford, O.
Smooth-On Mfg. Co., 568-574 Communipaw Ave., Jersey City 4, N. J.
Snap-on Tools Corp., Kenosha, Wis.
Snap-Tite, Inc., Union City, Pa.
Socony-Vacuum Oil Co., Inc., 26 Broadway, New York 4, N. Y.
Sola Electric Co., 4633 W. 16th St., Chicago 50, Ill.
Solar Aircraft Co., 2200 Pacific Highway, San Diego 12, Calif.
Soldering Specialties Co., Summit, N. J.
Solon Mfg. Co., Solon, O.
Solvay Process Div., Allied Chemical & Dye Corp., 61 Broadway, New York 6, N. Y.

Somers, Inc., H. J., 6063 Wabash Ave., Detroit 8, Mich.
Somerville Iron Works, Inc., Chattanooga, Tenn.
Sommerfield, Inc., Lou, 234 E. 128th St., New York, N. Y.
Sonneborn Sons, Inc., L., 404 Fourth Ave., New York 16, N. Y.
Sonner Burner Co., 412-420 E. 6th Ave., Winfield, Kans.
Sonoco Products Co., Hartsville, S.C.
Soreng Products Corp., 9555 Soreng Ave., Schiller Park, Ill.
South Bend Air Products, Inc., 322 E. Colfax Ave., South Bend 22, Ind.
South Chester Corp., Southco Div., Lester, Pa.
South Chester Tube Co., Front & Thurlow Sts., P. O. Box 60, Chester, Pa.
Souther Iron Co., E. E., 1952 Kienlen Ave., St. Louis 20, Mo.
Southport Paint Co., Div. Wesson Oil & Snowdrift Co., Inc., Savannah, Ga.
Southwestern Plastic Pipe Co., P. O. Box 306, Mineral Wells, Tex.
Spang-Chalfant, Div. of National Supply Co., P. O. Box 416, Pittsburgh 30, Pa.
Sparkler Mfg. Co., Mundelein, Ill.
Spartan Tool Co., 1918 Columbia Ave., Chicago 26, Ill.
Speakman Co., Riverview Wks., Wilmington 99, Del.
Special Chemicals Corp., 100 S. Water St., Ossining, N. Y.
Speed Selector Inc., 118 Noble Court, Cleveland 13, O.
Speedway Mfg. Co., Div. of Thor Power Tool Co., 1834 S. 52nd Ave., Chicago (Cicero), Ill.
Speed-Seam Co., 820 N. Walcott, Chicago 22, Ill.
Spence Engineering Co., Inc., 32 Grant St., Walden, N. Y.
Spencer Heater, Lycoming Div., Avco Mfg. Corp., 652 Oliver St., Williamsport, Pa.
Spencer Thermostat Div., Metals & Controls Corp., 34 Forest St., Attleboro, Mass.
Spencer Turbine Co., 486 New Park Ave., Hartford 6, Conn.
Sperti, Inc., 1077 Celestial, Cincinnati, O.
Spi-Rol-Fin Corp., 133 Greenwood Ave., Pequannock, N. J.
Sponge Rubber Products Co., The, Shelton, Conn.
Sporlan Valve Co., 7525 Sussex Ave., St. Louis 17, Mo.
Spray Engineering Co., 114 Central St., Somerville 45, Mass.
Spraying Systems Co., 3219 Randolph St., Bellwood, Ill.
Sprayo-Flake Co., 2715 Irving Park Blvd., Chicago 18, Ill.
Spring Packing Corp., 332 S. Michigan Ave., Chicago, Ill.
Springfield Boiler Co., 1939 E. Capitol Ave., Springfield, Ill.
Springload Mfg. Corp., 1412 Aurora, Seattle, Wash.
Sprout-Waldron & Co., Muncy, Pa.
Spurgeon Co., 23501 Hoover Rd., Van Dyke, Mich.
Square D Co., 6060 Rivard St., Detroit 11, Mich.
Square D Co., Industrial Controller Div., 4041 N. Richards St., Milwaukee 12, Wis.
Squires Co., C. E., The, 18502 Syracuse Ave., Cleveland 10, O.
Stamco Inc., New Bremen, O.
Stanat Mfg. Co., 47-28 37th St., Long Island City 1, N. Y.
Standard Asbestos Mfg. Co., 860 W. Evergreen Ave., Chicago 22, Ill.
Standard Electric Mfg. Co., West Berlin, N. J.
Standard Engineering Wks., 289 Roosevelt Ave., Pawtucket, R. I.
Standard Fuel Engineering Co., 667 Post Ave., S., Detroit 17, Mich.
Standard Instrument Corp., 350 Fifth Ave., New York 1, N. Y.
Standard Machine & Mfg. Co., 8213-15 Gravois Ave., St. Louis 23, Mo.
Standard Oil Co. of California, Bldg. 605 West Olympic Blvd., Los Angeles, Calif.
Standard Oil Co. of Indiana, 910 S. Michigan Ave., Chicago, Ill.
Standard Pressed Steel Co., Box 810, Jenkintown, Pa.
Standard Refrigeration Co., 332 S. Hoyne Ave., Chicago 12, Ill.
Standard Reseater Corp., 423 W. 126th St., New York 27, N. Y.
Standard Rolling Mills, Inc., 196 Diamond St., Brooklyn 22, N. Y.
Standard Stamping & Perforating Co., 3151 W. 49th Pl., Chicago 32.
Standard Transmission Equipment Co., 78 W. Union St., Pasadena 1, Calif.
Standard Tube Co., 24400 Plymouth Rd., Detroit 28, Mich.
Standard Ventilator Co., Lewisburg, Pa.
Stanley Electric Tools, Div. of The Stanley Works, Myrtle St., New Britain, Conn.
Stanley Works, The, 195 Lake St., New Britain, Conn.
Staples & Pfeiffer, 528 Bryant St., San Francisco 7, Calif.
Star Expansion Bolt Co., 147 Cedar St., New York 6, N. Y.
Star-Kimble Motor Div., Miehle Printing Press & Mfg. Co., 200 Bloomfield Ave., Bloomfield, N. J.
Star Stainless Screw Co., 190-A Union Ave., Paterson 2, N. J.
Star Tubular Products Co., 4747 S. Richmond St., Chicago, Ill.
Steam Turbine Div., Worthington Corp., Wellsville, N. Y.
Stedco Products, 71 Lehigh St., Wilkes-Barre, Pa.
Steel City Electric Co., 1201 Columbus Ave., Pittsburgh, Pa.
Steelcote Mfg. Co., 3418 Gratiot St., St. Louis, Mo.
Steel Improvement & Forge Co., 974 E. 64th St., Cleveland 14, O.
Steel Products Engineering Co., The, 1205 W. Columbia St., Springfield, O.
Steinen Mfg. Co., Wm., 43 Bruen St., Newark, N. J.
Stephens-Adamson Mfg. Co., 47 Ridgeway Ave., Aurora, Ill.
Sterling, Inc., 3744 N. Holton St., Milwaukee 12, Wis.
Sterling Air Conditioning Corp., Gastonia, N. C.
Sterling Electric Motors, Inc., 5401 Telegraph Rd., Los Angeles 22, Calif.
Sterling Engineering & Mfg. Corp., 114 Business St., Hyde Park 36, Mass.
Sterling Heat Specialties Inc., 260 N. Elm St., Westfield, Mass.
Sterling Radiator Co., Inc., 260 N. Elm St., Westfield, Mass.
Sterns-Flinn Corp., 30 Church St., New York 7, N. Y.
Stevens Mfg. Co., Inc., Mansfield, O.
Stewart Ice Machine Co., 1282 W. 1st St., Pomona, Calif.
Stewart Mfg. Co., Inc., Grove Ave., Cedar Grove, N. J.
Stewart-Warner Corp., South Wind Div., 1514 Drover St., Indianapolis, Ind.
Stewart-Warner Corp., U. S. Machine Div., Lebanon, Ind.
Stickle Steam Specialties Co., 2215 Valley Ave., Indianapolis 18, Ind.
Stic-Klip Mfg. Co., Inc., 50 Regent St., Cambridge 40, Mass.
Stillwater Clay Products Co., The, 3334 Prospect Ave., Cleveland 15.
Stockham Valves & Fittings Co., Box 2592, Birmingham 2, Ala.
Stoddard Industries, Inc., 1545 N. Kingsbury, Chicago 22, Ill.
Stokes Machine Co., F. J., 5910 Tabor Rd., Philadelphia 20, Pa.
Stokes Molded Products, Taylor & Webster, Trenton 4, N. J.
Stout & Sons, David, 7016 Manchester Blvd., St. Louis 17, Mo.
Stover Water Softener Co., 10 State Ave., St. Charles, Ill.
Stow Mfg. Co., 445 State St., Binghamton, N. Y.
Strahman Valves, Inc., 16-22 Hudson St., New York 13, N. Y.
Straight Line Foundry & Machine Corp., Direct Separator Div., The, 218 S. Geddes St., Syracuse 4, N. Y.
Stratford Pipe Scalloper Co., 1001 Magnolia Dr., Clearwater, Fla.
Strong, Carlisle & Hammond Company, 1392 W. Third St., Cleveland 13, O.
Struthers-Dunn, Inc., Lamb's Rd., Pitman, N. J.
Struthers Wells Corp., Titusville, Pa.
Stuart Supply, 417 Ninth St., Des Moines 9, Iowa.
Sturtevant Co., P. A., Addison, Ill.
Sub-Zero Freezer Co., Inc., Route 3, P. O. Box 2017, Madison, Wis.
Sudbury Laboratory, South Sudbury, Mass.
Sulflo, Inc., 1143 E. Jersey St., Elizabeth 4, N. J.
Sullivan Valve & Engineering Co., 1400 E. Second St., Butte, Mont.
Sumo Pumps, Inc., 375 Fairfield Ave., Stamford, Conn.
Sundstrand Machine Tool Co., 2531 11th St., Rockford, Ill.
Sun-Fire Stoker Corp., New Albany, Ind.
Sun Oil Co., 1608 Walnut St., Philadelphia 3, Pa.
Sun-Ray Burner Mfg. Corp., 139-24 Queens Blvd., Jamaica 2, N. Y.
Super-Cold Corp., 1020 E. 59th St., Los Angeles, Calif.
Super Radiator Corp., 6714 Walker St., St. Louis Park, Minneapolis 16, Minn.
Superior Clay Corp., The, Ulrichsville, O.
Superior Combustion Industries, Inc., Times Tower, Times Sq., New York 36, N. Y.
Superior Controls Co., Inc., 1835 South Bonnie Brae, Los Angeles 6, Calif.
Superior Steel Corp., Grant Bldg., Pittsburgh 19, Pa.
Superior Tube Co., Norristown, Pa.
Superior Valve and Fittings Co., 1509 W. Liberty Ave., Pittsburgh 26, Pa.
Supreme Electric Products Corp., 194 Vassar St., Rochester 7, N. Y.
Surface Combustion Corp., 2375 Dorr St., Toledo 1, O.
Sutton Corp., O. A., The, 1812 W. Second St., Wichita 2, Kan.
Swaby Mfg. Co., 3818 W. Armitage Ave., Chicago 47, Ill.
Swaine Mfg. Co., Fred J., 1300 N. Seventh St., St. Louis 6, Mo.
Swallow Airplane Co., Wichita, Kan.
Swartwout Co., The, 18511 Euclid Ave., Cleveland 12, O.
Swift & Co., Adhesive Products Dept., 4115 S. Packers Ave., Chicago 9, Ill.
Swift Lubricator Co., Inc., 19 James Bldg., Elmira, N. Y.
Swift Mfg. Co., Inc., 1455 E. Nine Mile Rd., Hazel Park, Mich.
Synchronous Flame, Inc., Walworth, Wis.
Synchro-Start Products, Inc., 8151 N. Ridgeway Ave., Skokie, Ill.
Syncromatic Corp., Watertown, Wis.
Syntron Co. 122 Lexington Ave., Homer City, Pa.

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T & H Engineering Co., 399 Main St., Little Ferry, N. J.
Taber Pump Co., 272 Elm St., Buffalo 3, N. Y.
Taco Heaters, Inc., 1160 Cranston St., Cranston 9, R. I.
Tal Bender, Inc., 417 N. Water St., Milwaukee 2, Wis.
Taller & Cooper, Inc., 75 Front St., Brooklyn 1, N. Y.
Tallmadge, Systems, Webster, Div. of Hoffman Specialty Mfg. Corp., 1700 W. 10th, Indianapolis 22, Ind.
Talon Tools, Inc., North Arlington, N. J.
Tamms Industries, Inc., 228 N. LaSalle St., Chicago 1, Ill.
Tapecoat Co., The, 1523 Lyons St., Evanston, Ill.
Taylor Co., Halsey W., 1259 N. Park Ave., Warren, O.
Taylor Forge & Pipe Wks., P. O. Box 485, Chicago 90, Ill.
Taylor Instrument Companies, 95 Ames St., Rochester 1, N. Y.
Taylor Sons Co., Charles, 710 Burns St., Cincinnati 14, O.
Taylor-Winfield Corp., 1052 Mahoning Ave., N. W., Warren, O.
Technical Ply-Woods, 228 N. LaSalle St., Chicago 1, Ill.
Technical Products Co., 1240 N. Canal, Sharpsburg, Pa.
Techniflex Corp., Port Jervis, N. Y.
Tectum Corp., 105 S. 6th St., Newark, O.
Tecumseh Products Co., Tecumseh, Mich.
Tele King Corp., 601 W. 26th St., New York, N. Y.
Telecron Dept., General Electric Co., Homer Ave., Ashland, Mass.
Telsit Insulation Co., 1933 West Farms Rd., Bronx 60, N. Y.
Templeton Bros., 177 Reservation Rd., Hyde Park 36, Mass.
Tempmaster Corp., 1338 McGee St., Kansas City, Mo.
Tempo Products Co., 2075 E. 65th St., Cleveland, O.
Temprite Products Corp., Dept. HPAC, E. Maple Rd., Birmingham, Mich.
Tenco, Inc., 51 Walnut St., Winona, Minn.
Tennessee Coal & Iron Div., United States Steel Corp., P. O. Box 599, Fairfield, Ala.
Tennesse Products and Chemical Corp., First American National Bank Bldg., Nashville, Tenn.
Tenney Engineering, Inc., 1090 Springfield Rd., Union N. J.
Termite Drills, Inc., 90 N. Lotus Ave., Pasadena 8, Calif.
Terre Haute Boiler Works Co., 1140 Crawford, Terre Haute, Ind.
Terry Steam Turbine Co., The, P. O. Box 1200, Hartford 1, Conn.
Texas Co., The, 135 E. 42nd St., New York 17, N. Y.

Texas Vitrified Pipe Co., Mineral Wells, Tex.
Texsteam Corp., P. O. Drawer 9127, Houston 11, Tex.
Thermac Co., 800 E. 108th St., Los Angeles, Calif.
Thermador Electrical Mfg., 519 S. District Blvd., Los Angeles 22, Calif.
Thermal Agency, 1515 Dallas Ave., Houston, Tex.
Thermapanels, Inc., 795 Kifer Rd., Santa Clara, Calif.
Thermek Sales Co., P. O. Box 268, Whitewater, Wis.
Thermo-Base Div., Gerwin Industries, 214 Spring St., Michigan, Ind.
Therm-O-Disc, Inc., 127 Crouse St., Mansfield, O.
Thermo Instruments Co., 1310 Old County Rd., Belmont, Calif.
ThermoRay Corp., South Buckhout St., Irvington-On-Hudson, N. Y.
Therm-O-Wheel, Inc., 1040 B-22 St., Far Rockaway 91, N. Y.
Thermoid Co., Trenton, N. J.
Thomas Co., Arthur H., W. Washington Square, Philadelphia, Pa.
Thomas Flexible Coupling, Main Ave. & Biddle St., Warren, Pa.
Thompson and Co., 1085 Allegheny Ave., Oakmont, Pa.
Thompson & Son Co., The Henry G., 277 Chapel St., New Haven, Conn.
Thompson Research & Mfg. Co., Davenport, Fla.
Thomson Electric Welder Co., 161 Pleasant St., Lynn, Mass.
Thomson Industries, Inc., Manhasset, N. Y.
Thor Power Tool Co., 175 N. State St., Aurora, Ill.
Thor Tool & Die Co., 865 Estabrook, San Leandro, Calif.
Thread-Ezy Mfg. Co., Corunna, Mich.
Threadwell Tap & Die Co., Greenfield, Mass.
Three Point Industries, 3767 N. Racine Ave., Chicago 13, Ill.
Thrush & Co., H. A., Peru, Ind.
Thwing-Albert Instrument Co., Penn and Pulaski Ave., Philadelphia 44, Pa.
Tierney Rotor Ventilator Co., 239 Fourth Ave., S., Minneapolis, Minn.
Tiffin Eaves Trough Clamp Co., 25 Miami, Tiffin, O.
Time 'Trol Co., 2 Embassy Court, Great Neck, L. I., N. Y.
Timken Roller Bearing Co., 1835 Dueber Ave., S. W., Canton 6, O.
Timken Silent Automatic Div., Rockwell Spring & Axle Co., Jackson, Mich.
Tinnerman Products, Inc., Dept. No. 16, P. O. Box 6688, Cleveland 1, O.
Tippett & Wood, Morris and Warren Sts., Phillipsburg, N. J.
Titchener, E. H. & Co., 67 Clinton St., Binghamton, N. Y.
Titeflex, Inc., 469 Frelinghuysen Ave., Newark 5, N. J.
Titus Mfg. Corp., Box 810, Hiway 20 West, Waterloo, Iowa
Titusville Iron Wks. Co., The, Titusville, Pa.
Tjernlund Mfg. Co., 2140 Kasota Ave., St. Paul 14, Minn.
Todd Shipyards Corp., Combustion Equipment Div., 81-16-45th Ave., Elmhurst 73, N. Y.
Toledo Pipe Threading Machine Co., 1445 Summit St., Toledo 4, O.
Torit Mfg. Co., 292 Walnut St., St. Paul 2, Minn.
Tork Clock Co., Inc., 1 Grove St., Mt. Vernon, N. Y.
Torq Electric Mfg. Corp., 1006 Interstate St., Bedford, O.
Torrington Co., The, Bantam Bearings Div., South Bend 21, Ind.
Torrington Mfg. Co., 70 Franklin St., Torrington, Conn.
Torrington Mfg. Co., The, Western Div., 15001 Oxnard St., Van Nuys, Calif.
TOT Towers, Inc., P.O. Box 2564, 5220 Lawndale, Houston 1, Texas
Toungate & Coats, P. O. Box 241; Austin, Tex.
Trade-Wind Motorfans, Inc., 7755 Paramount Bldg., Rivera, Calif.
Trane Co., The, La Crosse, Wis.
Tranter Mfg. Inc., Lansing 4, Mich.
Trent, Inc., Leverington Ave. and Wilde St., Philadelphia 27, Pa.
Trent Tube Co., 430 Church St., East Troy, Wis.
Trerice Co., H. O., 1420 W. Lafayette Blvd., Detroit 16, Mich.
Triangle Conduit & Cable Co., Inc., Triangle & Jersey Aves., New Brunswick, N. J.
Triangle Mfg. Co., 396 Division St., Oshkosh, Wis.
Trimont Mfg. Co., Div. of St. Pierre Chain Corp., 50 Frank St., Worcester, Mass.
Trimount Instrument Co., 3119 W. Lake St., Chicago 12, Ill.
Trimount Rotary Power Co., 189 Cedar St., Dedham, Mass.
Trindl Products, Ltd., 1807-11 S. Clark St., Chicago 16, Ill.
Trinity Equipment Corp., Roselle Park, New Jersey
Trion Inc., 1000 Island Ave., McKees Rocks, Pa.
Tripar Products, Inc., 14641 West Eleven Mile Rd., Royal Oak, Mich.
Triplex Heating Specialty Co., Inc., 252 N. Grant, Peru, Ind.
Trombetta Solenoid Corp., 329 N. Milwaukee St., Milwaukee 2, Wis.
Tropical Paint & Oil Co., 1244-82 W. 70th St., Cleveland 2, O.
Troy Engine & Machine Co., 20 Railroad Ave., Troy, Pa.
Truetite Corp., The, 36 Union Ave., Bridgeport 7, Conn.
Truflo Fan Co., 523 Main St., Harmony, Pa.
Tru-Line Corp., 1725 Clover Field Blvd., Santa Monica, Calif.
Trumbull Components Dept., General Electric Co., Woodford Ave., Plainville, Conn.
Truscon Laboratories, Caniff and Trunk R. R., Detroit 11, Mich.
Truscon Steel Div., Republic Steel Corp., 1315 Albert St., Youngstown 1, O.
Tryco Products, Inc., Railroad Sq., Westfield, Mass.
Tube Reducing Corp., Wallington, N. J.
Tube Turns, A Div. of National Cylinder Gas Co., 224 E. Broadway, Louisville 1, Ky.
Tube Turns Plastics, Inc., 224 E. Broadway, Louisville 1, Ky.
Tubing Appliance Company, Inc., 10321 Anza Ave., Los Angeles, Calif.
Tubing Seal-Cap, Inc., 808 W. Santa Anita, San Gabriel, Caif.
Turco Products, Inc., 6135 S. Central Ave., Los Angeles 1, Calif.
Turner Brass Wks., The, 821-47 Park Ave., Sycamore, Ill.
Tuthill Pump Co., 939 E. 95th St., Chicago 19, Ill.
Tuttle & Bailey, Inc., Corbin Ave., New Britain, Conn.
Tweco Products Co., P. O. Box 666, Wichita 1, Kan.
Typhoon Air Conditioning Co., Inc., 505 Carroll St., Brooklyn 15, N. Y.
Tywel Mfg. Corp., 60 Broadway, Brooklyn, N. Y.

U

[Also see "United States"]

U. S. Electric Welder Corp., 1258 Dorr St., Toledo, O.
U. S. Electrical Motors, Inc., 200 E. Slauson Ave., Los Angeles 54.
U. S. Electrical Tool Co., 3640 Llewellyn St., Cincinnati 23, O.
U. S. Expansion Bolt Co., P. O. Box 827, State St. & P.R.R., York, Pa.
U. S. Pipe & Mfg. Co., East Grand Ave., S. San Francisco, Calif.
U. S. Plug & Fitting Co., Wellington, O.
U. S. Thermo Control Co., 44 S. 12th St., Minneapolis, Minn.
Uehling Instrument Co., 473 Getty Ave., Paterson 3, N. J.
Ultrasonic Corp., 640 Memorial Dr., Cambridge 39, Mass.
Ultra-Viscoson Corp., The, 1240 Main St., Hartford 3, Conn.
Unexcelled Chemical Corp., Empire State Bldg., New York, N. Y.
Unifilter Co., 29845 W. 13 Mile Rd., Farmington, Mich.
Uniflow Mfg. Co., E. Lake Rd., Erie, Pa.
Unimax Switch Div., W. L. Maxson Corp., 461 W. 34th St., New York 1, N. Y.
Union Asbestos & Rubber Co., 332 S. Michigan Ave., Chicago 4, Ill.
Union Chill Mat Co., Grant Bldg., Pittsburgh, Pa.
Union Electric & Mfg. Co., 1057 Summit Ave., Jersey City, N. J.
Union Iron Wks., 1500 Cascade St., Erie, Pa.
Union Malleable Mfg. Co., P. O. Box 566, Ashland, O.
Union Metal Wks., 128 Carter St., Chelsea 50, Mass.
Union Pipe Fitting Co., Fort Atkinson, Wis.
Union Steam Pump Co., Capitol Ave., S. W., Battle Creek, Mich.
Union Water Meter Co., 333 Hermon St., Worcester, Mass.
Unistrut Products Co., 1013 W. Washington Blvd., Chicago 7, Ill.
Unit Alarm Co., The, 17 Saratoga Dr., Schenectady, N. Y.
United Chromium, Inc., 100 E. 42nd St., New York 17, N. Y.
United Cooling Tower Co., P. O. Box 5959, 4022 Broadway, Kansas City 11, Mo.
United Cork Companies, Central Ave., Kearny, N. J.
United Electric Controls Co., 85 School St., Watertown, Mass.
United Electric Service Co., P. O. Box 119, Wichita Falls, Tex.
United Machinery Sales Co., 7709 S. Ashland Ave., Chicago 20, Ill.
United Metal Hose Co., Inc., 36-01 43rd Ave., Long Island City 1, N. Y.
United Specialty Corp., P.O. Box 698, El Dorado, Ark.

[Also see "U. S."]

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United States Gasket Co., 602 N. 10th St., Camden, N. J.
United States Gauge Div. of American Machine and Metals, Inc., Sellersville, Pa.
United States Gypsum Co., 300 W. Adams St., Chicago 6, Ill.
United States Mineral Wool Co., Stanhope, N. J.
United States Ozone Co. of America, Crescent St., Scottdale, Pa.
United States Pipe & Foundry Co., Birmingham, Ala.
United States Radiator Corp., Penobscot Bldg., Detroit, Mich.
United States Register Co., Burnham St., Battle Creek, Mich.
United States Rubber Co., 1230 Ave. of the Americas, New York 20.
United States Steel Corp., 525 Wm. Penn Place Bldg., Pittsburgh 30.
United States Steel Supply Div., United States Steel Corp., 208 S. La Salle St., Chicago 4, Ill.
United States Stoneware Co., 60 E. 42nd St., New York 17, N. Y.
United States Stoneware Co., Plastics & Synthetics Div., Akron 9, O.
United Wire & Supply Corp., 1497 Elmwood Ave., Cranston, R. I.
Universal Controls Corp., 731 W. Davis St., Dallas 8, Tex.
Universal Convector Corp., 230 Manida St., New York 59, N. Y.
Universal-Cyclops Steel Corp., Bridgeville, Pa.
Universal Diffuser Corp., 1360 Garrison Ave., New York 59, N. Y.
Universal Electric Co., Owosso, Mich.
Universal Industrial Propeller Co., Stamford, Conn.
Universal Major Electric Appliances, Inc., D. T. & I. & Detroit, Lima, O.
Universal Mfg. Co., 1440 San Pablo Ave., Berkeley 2, Calif.
Universal Metal Hose Co., 2133 S. Kedzie Ave., Chicago, Ill.
Universal Sewer Pipe Co., 1500 Union Commerce Bldg., Cleveland, O.
Universal Valve Co., P. O. Box 444H, Elizabeth, N. J.
Universal Welder Corp., 2557 E. 79th St., Cleveland, O.
Uno Ventilator Co., 1236 Eastern Ave., Malden 48, Mass.
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Utica Products, Inc., Utica 4, N. Y.
Utica Radiator Corp., 2201 Dwyer Ave., Utica 2, N. Y.
Utility Appliance Corp., 4851 S. Alameda St., Los Angeles 58, Calif.
Utility Fan Corp., Div. of Utility Appliance Corp., 911 E. 59th St., Los Angeles 1, Calif.
Utility Laboratory, Inc., 330 36th St., Brooklyn 32, N. Y.

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V. & E. Products, Inc., Schuylkill Haven, Pa.
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Vacuum-Electronic Engineering Co., 86 Denton Ave., New Hyde Park, L. I., N. Y.
Vacuum Gas Burner, Olean, N. Y.
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Van-Packer Corp., Bettendorf, Ia.
Vanton Pump & Equipment Corp., Empire State Bldg., New York 1.

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W

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Wilson & Co., Inc., 4100 S. Ashland Ave., Chicago 9, Ill.
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Wilson, Inc., Thomas C., 21-11 44th Ave., Long Island City, N. Y.
Windmaster Corp., P. O. Box 776, Columbus 16, O.

Wind-Way Fan & Ventilator Co., 527 St. Joseph St., New Orleans 12.
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Winkler & Sons, Inc., A. E., 2337 N. 31st St., Milwaukee 10, Wis.
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Witte Engine Works, Oil Well Supply Div., United States Steel Corp., 1600 Oakland Ave., Kansas City 26, Mo.
Wittenmeier Machinery Co., 850-860 N. Spaulding Ave., Chicago 51.
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Worner Electronic Devices, Rankin, Ill.
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Worthington Corp., Harrison & Worthington Sts., Harrison, N. J.
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X-Y-Z

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Yale & Towne Mfg. Co., Stamford, Conn.
Yardley Plastic Co., 138 Parsons Ave., Columbus 15, O.
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York-Shipley, Inc., York, Pa.
Yorktowne Machine Co., 538 S. Queen St., York, Pa.
Yost Mfg. Co., Meadville, Pa.
Young & Bertke Co., 1004-1014 Hulbert Ave., Cincinnati 14, O.
Young Radiator Co., 709 S. Marquette St., Racine, Wis.
Young Regulator Co., 5209 Euclid Ave., Cleveland 3, O.
Youngstown Sheet & Tube Co., Stambaugh Bldg., Youngstown 1, O.
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Zimmerman Packing Co., 2768 Highland Ave., Cincinnati 12, O.
Zingheim Co., William C., 5050 Lake St., Chicago 44, Ill.
Zink Co., John, 4401 S. Peoria, Tulsa 5, Okla.
Zone-Heat Regulator Co., Box 188, Garrettsville, O.
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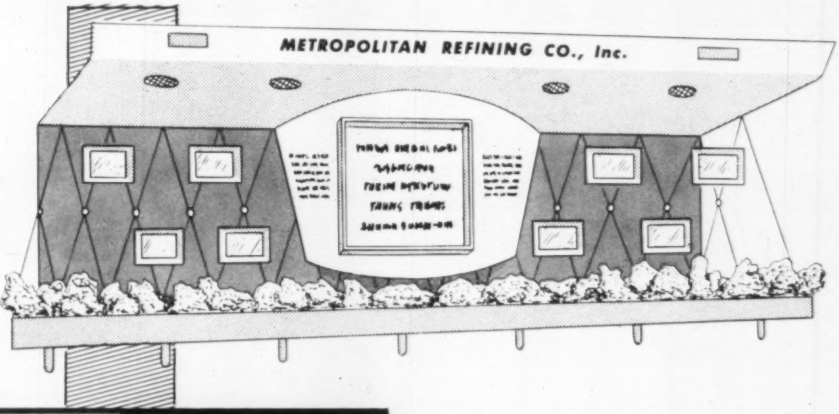
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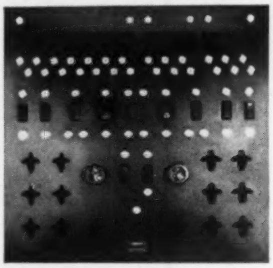

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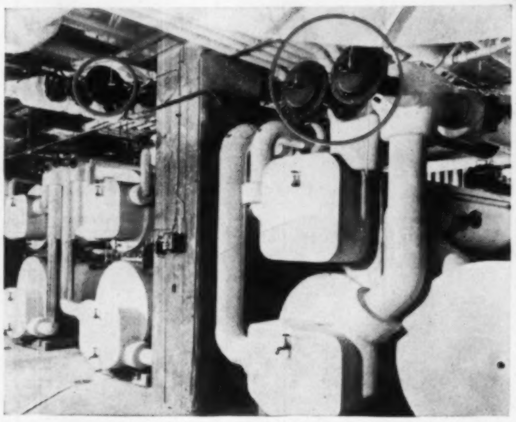

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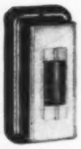
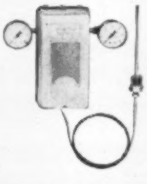
FEATURES OF JOHNSON CONTROL IN THE EQUITABLE BUILDING



The building is divided into heating and cooling zones. Most floors are arranged to provide 11 zones. Each zone is controlled separately by a Johnson Room Thermostat.



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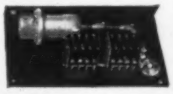

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